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CHRISTMAS SEALS—THEIR ORIGIN AND PURPOSE

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Among Canadians at Christmas time, TB Seals have become a tradition. We have seen them offered for sale, or come to us in the mails since the days of childhood, yet few of us know of their origin.

Christmas Seals as the means of raising money for tuberculosis prevention were unheard of till 1904. This Christmas, less than 50 years later, they will bring in millions of dollars to use in the fight against TB, they will be sold in 70 countries and on every continent.

Also, this year, the colorful little Seals, with the double-barred cross, will be introduced to the people of India. Ghandi's birthday, rather than Christmas, has been chosen as the selling time, so not to offend the devout of other religions.

Tuberculosis was the worst of the disease killers when 44 years ago the old Toronto *Globe* announced one morning new "Good-will-to-men" stamps, to help those suffering from "consumption."

Today, tuberculosis takes only an eighth as many lives as it did then, and barring some unforeseen incident, is likely to become one of the minor reasons of death.

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The direct relation of the one to the other, the rapidly rising sale of Christmas Seals in Canada and elsewhere, and the steadily declining death rate, will perhaps never be determined. To do so would be almost impossible.

Yet there is no denying that the splendid preventative and treatment programs these Seals have financed have had a direct bearing in cutting down the death rate.

It is certainly more than co-incidental that Denmark, the country of the Seal's origin, has the lowest death rate the world over. And that in the heavily populated Toronto area, the death rate has dropped from 25.8 to 12.6 per hundred thousand since community x-ray surveys were begun seven years ago by the National Sanitarium Association.

Canada's death rate today is one of the lowest anywhere. The World Health Organization lists it as fourth lowest. Holland is next to Denmark, and the United States, third. In each of these countries, large-scale Christmas Seal appeals have been held for some years.

Where did the idea originate, and how, in so brief a period, has it become almost world-wide?

It started with a Danish postman, Einor Holboell, the more real to this Canadian, last Christmas, when a relative of Holboell's, who had emigrated to this country, asked for some Seals to send back home.

The inspiration which has since brought new hope and happiness to thousands, came to Einor Holboell one sharply cold night in 1903, as he worked late sorting Christmas mail on the outskirts of Copenhagen. It came as he looked from his window to see two ragged little waifs disappearing into the storm.

How ironical, he reflected, that so much kindliness and good-will for one's fellows, represented by the messages and parcels dropping beneath his fingers, should cross continents and even oceans, yet escape entirely little ones such as these.

What could he do? He was just a postman. But why not an extra stamp, sold only at Christmas, the money to go to help all poor children, poor children everywhere.

Overflowing with excitement, Holboell told the men he worked with of his idea. They were most enthusiastic, and decided that as soon as they could work out details they would go to the King of Denmark and ask for his Royal blessing.

King Christian of Denmark was thoroughly pleased with their plan and suggested the first stamp, or Seal as it was later called, should carry the picture of his Queen. So it was that in 1904 the very first Seals, with the Queen of Denmark's picture, were offered to the public. Four million were sold.

However, as might have been expected, even a remarkable achievement such as this could not begin to fill the needs of all destitute children in Denmark. Some particular group would have to be selected. The crippled children seemed most appealing, in particular those whose crippling had come from tuberculosis of the bone. Money from the Seals was turned into building two hospitals where these children might be treated. This was the first year of Christmas Seals. Already the postman's dream was heralding new hope.

On this side of the Atlantic, three years later, a small sanitorium near Delaware, Penn., was about to close its doors for lack of $300. The little hospital had eight patients, all of them poor, all with nowhere to go if the sanitorium were to close down. The doctors were worried, but there was little they could do. For years they had been giving their services, and were willing to continue, but had no means of raising the $300.

It scarcely needs pointing out that in 1907, $300 went a great deal farther than it does now. It was also harder to get.

One of the doctors, Joseph P. Wales, was not entirely without hope. He wrote to his cousin Emily Bissell of Delaware, Pa., a very public-spirited woman, whom he had known to have gone to the rescue of a number of good works. Was there anything she could suggest? She remembered a magazine article sent to her by a Danish American telling of the postman Holboell and his Christmas Seals and contacted Red Cross thinking they were the organization to sell the Seals. They were sympathetic, but according to their constitution could not raise money for a specific project in one particular area.

Next Emily Bissell contacted her friends. Two of them gave her $20 apiece and a friendly printer said he would print the Seals at cost. Miss Bissell

decided she would do the design, promptly sitting down to draw the first U.S. Seal, a holly wreath surrounding a Red Cross, highly valued today by philatelists who collect Christmas Seals.

However all was still far from bliss. The Postmaster General forbade the selling of Seals by the Post Office, as had been the practice in Denmark. He also predicted nothing but black ruin for Miss Bissell's project, and to make matters worse, the advertising and publicity people agreed with him.

They had underestimated Miss Emily Bissell. With her friends giving her moral support, she set up a booth in the lobby of the Delaware Post Office and on December 7, 1907, opened the first North American sale of Christmas Seals. Furthermore, she penned the following message, printed on each package:

25 Christmas Stamps
One penny apiece
Issued by the Delaware Red Cross to stamp
Out the White Plague
Put this stamp with message bright
On every Christmas letter
Help the Tuberculosis fight
And make the New Year better
These stamps do not carry any kind of mail,
but any kind of mail will carry them.

Thoughts or comments of the Postmaster General do not appear to have been recorded.

Receipts for the first day were something less than $25. The following days were slower, and so to get the money more quickly, Miss Bissell realized she would need newspaper support. She approached the Philadelphia North American. Her proposal shocked the Sunday editor. Linking Christmas, a festive and friendly family season, with tuberculosis, the world's worst killer, and certainly not a pleasant circumstance in any family, was to him simply unthinkable.

On her way from his office Emily Bissell, whether still scheming or not, stopped to compliment one of the columnists on his writing, and also managed to tell him why she was in town. He was quick to appreciate the Seal idea, and rushed in to explain it to the paper's top editor. This man, fortunately, saw the woman's vision. "Tell Miss Bissell," he said, "the North American is hers for the holidays. Drop what you're doing, and give this your whole time. Take all the space you need. Have her send us 50,000 Seals by tomorrow."

That was how the Philadelphia North American began the first important sale of Seals on the continent. Opening day, a small newsboy, hardly big enough to see over the counter, shouted "Gimme one of them. Me sister's got it." Three thousand, not three hundred dollars was collected and Dr. Wales got his money. The little sanitorium stayed open and the site was later purchased for Hope Farm, Delaware, today a fine, modern sanitorium.

Toronto and Hamilton TB Associations could not help but be impressed. The year following they, too, began selling Christmas Seals. The old Toronto Globe, as mentioned earlier, led the crusade, followed by newspapers all over the country. Toronto school children, that first year, sold 10,000 Seals, and from Elmira, Ontario, a small girl sent twenty-five coppers "to help the poor consumptives." Toronto raised $6,100 that first year. Last Christmas the Toronto area contributed close to $200,000.

Much has happened in the years between, as one community after another from Victoria to Newfoundland took up the selling of Seals. Today there are 300 community TB associations, each of them autonomous, each of them spend-

ing their funds as the local situation most urgently demands. From Canada, as a whole, last year, Christmas Seals brought an all-time high of $1,646,000.

These local associations have followed a fairly uniform pattern. Their first step was to build sanitoria. As the worth of these hospitals became evident, provincial governments took over their financial support. Ten years ago mass x-ray surveys were almost revolutionary. They were pushed by the local associations all over the country until today we have these surveys in each of the 10 provinces, some supported by government funds, others by money from Seals.

Survey results for all of Canada are not at hand. We do have those of the National Sanitarium Association, which despite its name operates only in the Greater Toronto area, also in York and Simcoe counties and the districts of Muskoka and Parry Sound. This Association, the largest, began its community industrial and business surveys seven years ago. What has been the result? Briefly they are as follows: One and one-half million free x-rays revealed 3,251 active cases of tuberculosis requiring sanitorium care. Thousands more with inactive conditions, many of them contacts of the active cases, are reporting to the Association's Gage Clinic for periodic check-ups. The Clinic itself, the largest and one of the best on the continent, is financed entirely from the sale of Christmas Seals.

If all across Canada similar advances have been made, and there is every indication to believe they have been, then Einor Holboell, Dr. Wales and Emily Bissell have been glorious heroes, if unsung, to thousands of Canadians.

It would be most ridiculous, however, to give undue credit to Christmas Seals for all progress against tuberculosis. The new drugs, surgery, improved hospital conditions and rehabilitation efforts, have combined to reduce the death rate in Canada to an all-time low of 24.5 per 100,000. The latest figures given by Ottawa are as follows:

Newfoundland	70.9
P.E.I.	17.2
Nova Scotia	19.6
New Brunswick	26.0
Quebec	38.3
Ontario	12.6
Manitoba	20.5
Saskatchewan	19.0
Alberta	15.5
British Columbia	25.1

Much has been done, it is true, yet we are far from having finished our work. There are 12,000 new cases of TB in Canada every year and 250 deaths every month. As long as there are thousands of undiscovered cases, as long as new ones come to light which could have been prevented, and as long as relapses are due to lack of proper rehabilitation, we have need for local committees and Christmas Seals.

The double-barred cross on all Seals is the emblem of tuberculosis workers the world over. Signifying courage and success, it was the cross of the Duke of Lorraine, first Christian ruler of Jerusalem, and is said to have brought him victory during the Crusades. On the 1952 Seal, the double-barred cross emerges more clearly than before. The artist began with the cross, and added a lighted candle as a twin emblem of an even brighter future. Let us hope that through the medium of Christmas seals, that future will materialize.

THE WORK OF SIR WM. GAGE

F. D. BEAUCHAMP, C.P.A.*

William Gage was a stern, energetic man. He was successful in business, and wealthy in his own right. A contemporary says of him: "A man prolific of ideas. They came in such manner and with such rapidity that those to whom they were proposed became almost bewildered". Gage had witnessed friends, and valued employees, die from tuberculosis and became appalled that nothing was done for them.

At that time, 1893, the prescribed treatment for tuberculosis was a change of climate, preferably Arizona or the Rockies. There were few patients able to follow this prescription. The family physician had recently become aware of the infectious nature of tuberculosis, but there was still no cure. General Hospitals would not accept tuberculosis patients, and the few hospitals for incurables could not cope with the volume or the problems they presented.

Wm. Gage studied all available information by travelling across Canada and the United States. There was little to be learned. After his travels, he realized that he must depend almost entirely upon the one approach he knew—the business approach. This would take the form of a pilot plant, with doctors and nurses in place of engineers and technicians.

His business ability served him well. He had a faculty for selecting the right men, and for enlisting their help. He relied heavily on the advice of Dr. J. E. Graham and Dr. N. A. Powell. It was the former who persuaded Gage of the suitability of the present site of Muskoka Hospital. This was after Mr. Gage had nearly been persuaded that Canada's first hospital for tuberculosis should be built at Kamloops, B.C. It is noteworthy, Sir William Van Horne, then President of the C.P.R., volunteered free passage for patients from all parts of Canada should the hospital be built at Kamloops.

Gage, impatient for action, offered $25,000 for a consumptive hospital, if the City of Toronto would pay for the site. Two futile and frustrating years of negotiations satisfied Gage that the time for municipal participation was not ripe.

The enterprise must depend on private funds, and Gage's ability to attract the interest of outstanding men did not fail him. Hart A. Massey, a prominent business man and philanthropist, offered to match Mr. Gage's contributions of $25,000, and in 1896, the Muskoka Cottage Hospital was opened near Gravenhurst, Ontario. It was Canada's first hospital for tuberculosis. It was Wm. Gage's pilot plant.

Six years of operating the pilot hospital not only proved it a success, but brought forward four major considerations:

1. Climate was of secondary importance.
2. Hospital treatment held promise not only for incipient cases of tuberculosis, but for advanced cases also.

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3. The early separation of tuberculous patients from contact with family and friends was the most effective preventive measure yet observed.

4. A tuberculosis hospital could not be financed by patients themselves.

With the success of Muskoka Hospital established beyond doubt, it was needless for Gage to find ways and means of building similar hospitals across Canada. This had been his goal, but to his great pleasure, he found voluntary organizations modelled after his own creation springing up in all parts of Canada. It was now but a question of time.

So far nothing had been done for the many with advanced tuberculosis. Their circumstances were distressing. No hospital would accept them. They remained at home to die and to infect their families. Gage and his medical and lay colleagues prepared to attack this position.

It is unbelievable that efforts to obtain a site for the hospital for advanced tuberculosis were blocked for several years by municipal and provincial legislation arising out of the colossal fear and ignorance of the public, both lay and official. Yet this was the cause.

The annual report of the National Sanitarium Association for 1905 gives a first-hand account of these difficulties:

"Five years ago the first practical step in this direction (hospital for advanced disease) was taken when an option was secured on a property near High Park. But the feeling of the residents in that section was such that the property had to be given up, and the price paid for the option was lost. A little later about eight acres were purchased in the Wychwood section, at the head of Bathurst Street, and outside the city limits. Public sentiment, or shall we say prejudice, was against the project. In the dying hours of the local legislature a clause was inserted in the statutes making it necessary that a Hospital for the treatment of tuberculosis should be 150 yards distant from any habitable dwelling. This made it impossible to use the eight acres purchased. Nine acres, or thereabouts, adjoining the eight, were secured, thus giving room to comply with the statute, but again adverse legislation was forthcoming. The Health Act was amended so as to make it necessary that besides being 150 yards distant from any habitable dwelling, the promoters of such undertaking must first secure the permission of the health board of the municipality in which it was proposed to establish a sanitarium of the kind. This rendered once more abortive the effort to establish a consumptive hospital at the head of Bathurst Street. Promises were made by the local legislators that this legislation would be amended at a later session. The friends of the movement possessed themselves in patience for another year, only to be disappointed once more. Steps were taken to procure a property in some other part of York Township. In North Toronto an eligible site was found, and a public meeting was called to consider the question. Local opposition to the establishment of a consumptive sanitarium was such that this site also had to be abandoned. Again, another site was secured, but when the owner learned the purpose for which it was to be used, he refused to close the purchase."

"It will be seen from the foregoing that whilst considerable time was lost in the effort to find a location, yet it was not for want of prompt and active steps being taken by those anxious to see the work proceed. Nothing daunted, the committee once more went on a tour of discovery, and finally decided on the purchase of the property then known as the Buttonwood Farm, the old family residence of Mr. Charles Lindsay. The Health Board of York Township in this case very readily granted the necessary permission to establish a consumptive sanatorium under the statute. This was in July 1903. Mr. Gage purchased these forty acres with certain buildings thereon, with a view to handing

the property over to the Trustee Board to be organized later on—a step that has since been taken".

The observations of another contemporary, Dr. William James Dobbie, who was later to become superintendent of the Toronto Hospital, at Weston, further assist in understanding the problems of that day:

"The restrictions imposed by Boards of Health and Municipal Councils, making difficult the selection of a site, as previously mentioned, reflected rather fairly public opinion at that time. There were few who had any adequate vision as to the possibilities of the campaign against tuberculosis, but this general lack of enthusiasm or even approval on the part of the public did not deter the founders from planning numerous extensions of their activities. Their example and enthusiasm served to change public opinion, enlist public support, and served also to stimulate others to plan similar activities in other localities."

A further extract from the annual report of the National Sanitarium Association for 1906 illustrates the vision and spirit of the small lay-medical group:

"The Toronto Free Hospital for Consumptives is to set aside a ward specially equipped for children suffering from pulmonary tuberculosis. No hospital in Canada has before made provision for children who have become stricken with pulmonary tuberculosis. . . ."

It is easy enough now to know that the two small hospitals at Weston and Muskoka were important far beyond the measure of relief and treatment they could provide. They served as ignition for the large unexploited fuel of lay-medical co-operation. Our modern life is filled with such co-operation, but in each instance it can be shown there is a careful balance between the lay and the medical. Wm. Gage was a perfect fulcrum, and demonstrated not only that equilibrium could obtain, but once obtained, could accomplish remarkable things. A medical contemporary of Gage said: "He never concerned himself with the details of medical and nursing departments except to urge that care be taken to see that the staff be adequate and competent." Gage showed that medical and lay groups could work in harmony with remarkable results.

It is noteworthy that the new hospital for advanced tuberculosis aroused considerable interest abroad. The following are extracts from a long article appearing in the British Medical Journal, February 9, 1907, contributed by Sir W. J. Broadbent, Physician-in-ordinary to His Majesty, King Edward, after a visit a few months previously:

"This consideration gives to measures for preventing the dissemination of the tubercle bacilli primary and predominant importance, and it is the special merit of this little hospital (Weston San) that its purpose is to meet this requirement."

"In dealing with consumption there are two distinct objects to be kept in view—the relief and cure of those already affected and the protection of the community generally from the disease."

"In order that any sufficient degree of success may attend the first of these objects, the cases must be taken in hand at an early stage. It is on their behalf that sanatoriums have been erected for the open-air treatment, and it has almost come to be thought that these sanatoriums are the chief means to be relied upon for the suppression of consumption. They are, indeed, of very great importance in the combat against tuberculosis, since every case arrested ceases to be a focus of contagion, but the realization of the value and efficiency of the open-air treatment was an accidental coincidence with the discovery of the tubercle bacillus and the general recognition of the part it plays in the spread of the disease. . . ."

"The Hospital for advanced and far-advanced consumption in Toronto is the first which, so far as I am aware, has been erected purely and simply with a view to prevention. I do not know who is to be credited with the idea, whether lay or medical, but I regard it as a fine instance of Canadian common sense and foresight. Its realization is due to Mr. Gage, Chairman of the Board of Management."

Accomplishments in subsequent years reveal the superb blending of medical direction and business enterprise. There was a deplorable shortage of nurses trained for tuberculosis. Hence, in 1907, the Association created a training school for nurses which was to continue for 25 years, until it became recognized that every nurse should have training in tuberculosis. The Association still conducts post-graduate courses for nurses and receives affiliates from general hospital training schools.

As early as 1909, the Association engaged visiting nurses to aid in prevention. One can do no better than to read the early reports of these nurses to understand the conditions of that day:

"During the past ten months I paid one thousand and nineteen visits to patients, sent thirty-nine patients to the Free Institutions and had fifty-two houses disinfected. It is with very great pleasure that I am able to state that the work is steadily growing all the time. More calls come in from ministers, doctors, friends of the patients, etc., and that without a single exception I have been well received and welcomed in every home in which I visited, and almost always the advice and suggestions I gave have been eagerly followed and acted upon. In a great many cases, after visiting them for a short time, the patient was induced to go to one of our institutions. Some of them for various reasons, wish to remain at home, and I continue visiting them there.

The homes which I go to are chiefly very poor ones, and the poverty and destitution I meet with is often very great, want of means often preventing the patient from obtaining proper nourishment. Owing to the lamentable ignorance of many people as to the contagious nature of the disease—proper precautions are seldom taken to safe-guard the rest of the inmates in the home.

As well as looking after the sick ones of the family, I invariably have any of the other members, who have been exposed to the danger of contagion, examined and steps taken for the prevention of its spread.

I have also had the pleasure of meeting and speaking to various classes of women, girls, and young people connected with different churches, and thus furthering the interest taken in our work and in our institutions."

Today, hundreds of visiting public health nurses have taken over this work, the necessity of which was so early recognized.

In 1911, the first free diagnostic clinic was opened by the Association in a plain little building on King Street, Toronto. Again, it may be of interest to read some parts of the first report of this little clinic:

"The need for such a factor in the work has been felt for some time, and it was confidently believed that in time the work to be done might be very considerable. It was hardly expected, however, by even the most sanguine that it would be possible in so short a time, to record so much accomplished as is indicated in the review of the work of the past ten months which this report is intended to present. . . ."

"During this period also, 486 patients have visited the Dispensary. Of these 208 were new patients, and 278 repeats. There were 38 contact cases and of these 6 were found definitely tuberculous, 5 were suspicious and are under observation, reporting regularly at the Dispensary. Six patients have been lost track of, 5 referred to other clinics, and 3 to private physicians, it being found that they were able to pay, 3 removed, 3 deported, and 12 have died.

There were 57 sent to the Muskoka Free Hospital and 85 to the Toronto Free Hospital. Five patients were cared for in their homes until they died. These either became too ill to be removed before there was a vacancy or refused to go into a hospital. In addition, 23 patients returned from the Muskoka Free Hospital or Toronto Free Hospital are in more or less regular attendance at the Clinic.

Medicine and relief have been dispensed as follows:

Prescriptions filled	72
(From the 10 cent fee charged those who can afford it, $1.60 was collected which was turned into the Samaritan Club.)	
Refills	750
Sputum cups	38
Clothing	38 garments
Cups of soup	211
Rent paid	$15
Eggs	36 doz.
Milk	900 pints."

William Gage was knighted by his sovereign for his work. The hospitals at Weston and Gravenhurst with combined capacity of 1100 beds, the Gage Institute Chest Clinic in Toronto, the travelling and reference clinics giving a quarter million free chest X-rays annually, are living monuments to Sir William Gage and his colleagues.

Help Fight TB

Buy Christmas Seals

THE CONTRIBUTION OF ROBERT KOCH

D. C. BROWN, M.D.*

As our attention centers on the disease tuberculosis, it is worthwhile to consider briefly the man who laid the foundation of our knowledge of this disease. He is often referred to as the "Father of Bacteriology". However, among his many contributions in the realm of bacteriology, the work on tuberculosis stands supreme. Robert Koch, of course, is his name.

Koch was born in 1843 in the small German town of Klausthal in the Harz mountains. He was one of thirteen children and the son of a mining engineer. With the local boys he went to the town secondary school where he became interested in natural science. Through the years he became a very zealous collector of minerals, plants and small animals. After tramping about the Harz mountains in search of natural wonders, he would return home and read extensively in geology and zoology. Life had its lighter, less serious aspect, however. Koch belonged to a group of boys who were renowned throughout the town for their pranks, and according to reports their activities were quite varied and extensive. This facet of Koch's youth reminds one of William Osler's spirited and lively boyhood years.

Fortune smiled on the Koch family just when Robert was completing secondary school. The family received a lump sum of money sufficient to allow Koch to enrol in Medicine at the University of Göttingen. The choice of university was very fortunate because it had excellent teachers on its staff—teachers who left no small impression on Koch as we shall see. The staff included Wohler, the organic chemist who first synthesized urea, Krause the pathologist, Meissner the physiologist, and Henle the anatomist. Koch came to be closely associated with Henle in his work, and did physiological research on succinic acid with Meissner. The most valuable training, however, was received in Krause's pathological laboratory where the instruction in pathological and microscopical technique was the best available anywhere at that time. This training later proved to be invaluable to Koch in his researches on anthrax, tuberculosis and cholera.

In 1866 at the age of twenty-three, Koch received his Doctor's degree and gave his graduating address on Succinic Acid in the Human Body. After graduation he assisted at several hospitals around the country and practised in several small towns. Finally he became an army surgeon in the Franco-Prussian War. After the war he became the district physician (Kreis physicus) in the small town of Wollstein. Here he made long rides day and night to visit patients, and thus was out of touch with the stimulating intellectual activity of the university which he enjoyed so much. It was here in Wollstein amidst adversity in the form of poor equipment, fatigue, monotonous long journeys and probably most important, isolation from the vital flow of ideas and enthusiasm emanating

*From an address to the Osler Society.

from a university, that the true greatness of Robert Koch shone forth. He fitted out a small laboratory in part of his consulting room, and in the year 1872 with meagre equipment consisting of a microtome, microscope and an incubator, he began the study of anthrax (splenic fever) which was rampant among the local livestock.

Many years later at a dinner given in his honour, the following was said about Koch's Wollstein days:

"Who does not know how often the spirit of the country physician is broken and his thinking powers dulled by the endless round of visits. The reality of the wagon rattle fits in badly with the ideal of scientific thought. But the district physician of Wollstein knew how to glean some hours from the restless and driving activity of practice."

In 1876 Professor Cohn, head of the Botany Department, University of Breslau, received a letter from one Robert Koch, an obscure country physician from the equally obscure town of Wollstein. The letter claimed that the life history of the anthrax bacillus had been worked out. At Professor Cohn's request Koch gave a three day demonstration of his findings. Into this short period he crowded all the expertness of technique while demonstrating the many steps leading up to his conclusions reached after four years of quiet, patient study. He demonstrated how he took bacilli from an animal dead of anthrax and grew them on a hanging drop preparation of sterilized serum. He showed the bacilli multiplying and forming spores, and he illustrated how he grew generations of pure bacterial cultures by discarding any contaminated drops. To complete the picture he reproduced anthrax in animals by inoculating bacilli grown for generations. This experimental work settled for all time the cause of anthrax, and answered arguments that blood viruses and poisons were the aetiological factor.

Among others present at Koch's demonstration was Professor Cohnheim the great pathologist. He was very much impressed with Koch's thoroughness and commented, "It leaves nothing more to be proven." This contact with Cohnheim was destined to be important in Koch's future.

The demonstration on anthrax was well received as it was the first time that the life history of a bacterium had been developed and the bacterium so conclusively shown to be the cause of disease. There were no immediate repercussions from his demonstration, so Koch returned home to his country practice where he continued his investigations along new lines. In the next few years he published papers on the fixing and staining of bacteria, the artificial production of wound infection, and the use of the oil immersion lens and Abbe condenser.

In 1878 at the age of thirty-five, Koch was offered, through the influence of Cohnheim the pathologist, a full-time laboratory position in Berlin. In his new position Koch, with characteristic energy, began to work using the latest equipment and surrounding himself with a group of able assistants. It was in this laboratory in Berlin that he made his greatest discoveries.

First Koch busied himself with developing a technique for obtaining pure cultures of organisms. This had baffled the ablest investigators of his day, and was an obstacle which above all others barred the way to progress in bacteriology. Ultimately Koch was successful

in his quest. The materials used consisted of a nutrient gel solution of such strength that it was hard when cool, and meat infusion which was added to provide food for the bacteria. His technique was to spread the warmed medium in a dish and to allow it to cool and harden. Then the surface was innoculated by a platinum wire loop previously dipped in a reservoir of bacteria. Different types of bacterial colonies developed along the track of the wire loop, and any one type of microorganism could be singled out and replanted on a new medium.

The development of this rather technical process opened the way for great progress in bacteriology because it was now possible to isolate, study and grow a single type of bacterium instead of a heterogeneous collection of different bacterial types. Indeed, all of Koch's future discoveries were a direct result of this fundamental perfection of method. Koch said himself, "When the right method is found the solution to the problem comes to the hands as easily as ripe apples fall from a tree."

In 1882 at age thirty-nine, Koch announced to the world that he had discovered the aetiological agent of tuberculosis. This achievement was most certainly the climax of his career and his most important contribution to our knowledge of disease. To demonstrate that the tubercle bacillus was the cause of tuberculosis, Koch had to devise a method of staining the bacillus in tuberculous lesions. Combining past experience in using Weigert's aniline dye stains with great ingenuity and persistence, he at last devised a successful method of showing the tubercle bacillus in situ. His method combined the use of a methylene blue stain with a vesuvian counterstain which decolorized the bacillus which appeared as blue rods against a brown background. The next step was to grow the bacillus. This proved very difficult, and all early efforts failed. Showing characteristic persistence and infinite patience, Koch finally succeeded in growing the tubercle bacillus on coagulated blood serum. Finally he was able to reproduce tuberculosis in laboratory animals by inoculation.

Koch's interest in tuberculosis was not confined to the laboratory however. With his usual interest in the practical aspects of disease, he suggested methods for control of tuberculosis spread—suggestions which are still very practical, such as improvement of domestic and housing conditions of the poor, compulsory notification of the disease, and adequate hospital and sanatorium care for active cases.

The impact of Koch's announcement of the discovery of the cause of tuberculosis was tremendous. It completely revolutionized thinking about tuberculosis, and the concept of the bacterial causation of disease was extended to other diseases. Treatment and prevention of tuberculosis could now proceed on a rational basis. There is no better testimony to the importance of Koch's discovery than the dwindling tuberculosis mortality and morbidity rates since the year 1882.

The work on tuberculosis was the first product of Koch's method of making pure cultures. In the years to follow there was a veritable succession of victories for his method. The feature of all Koch's work in establishing a micro-organism as the cause of a disease was his adherence to certain principles of procedure now universally known as Koch's postulates. These are so well known that they do not merit repetition. What is generally not

known is that Koch's old teacher, Henle of Göttingen, had announced principles very similar forty years previously.

In 1883 at the request of the German government, Koch went to Egypt and to India to investigate cholera epidemics. By clinical and post mortem observations he concluded that cholera was spread by contaminated water. Bacteria cultured from water reservoir tanks were found to be similar to the bacilli found in the gastrointestinal tract of those who had died of cholera. Koch was able to fulfill his four postulates and thus to prove the cholera vibrio the aetiological agent in cholera. Soon after the report of his work on cholera, an International Congress on Cholera was assembled. Here it was decided to have notification of all cholera patients, periodic examination of rivers draining infected areas, and efficient water works and filtration plants. These recommendations were all a direct result of Koch's determination of the aetiological agent.

In 1885 at the age of forty-two, Koch was made Professor of Hygiene and Preventive Medicine at the University of Berlin. Soon his laboratory was crowded with students from all over the world. Probably as great as his scientific achievement was Koch's influence as a teacher. Among his more widely known pupils at Berlin were Welch, later Professor of Pathology at Johns Hopkins; Loeffler who demonstrated the aetiological agent of diphtheria and glanders; Gaffky who demonstrated the aetiology of typhoid fever, and Kitasato who discovered the cause of tetanus and bubonic plague.

For the remainder of his life Koch laboured endlessly at Berlin in seeking out the cause of disease and in devising measures to control disease spread. Against the wealth of positive achievement in Koch's life there stands but one small error in scientific judgment—a lapse of his usual criticism of his own work, which served to show that he, too, had human failings. I refer, of course, to the announcement in 1890 that tuberculin was the long awaited cure for tuberculosis. To everyone's disappointment tuberculin was found ineffective as a cure for tuberculosis. Although therapeutically valueless, it has proved of considerable value in the diagnostic field. Interestingly enough, some contemporary English workers report good results using small doses of tuberculin in tuberculous meningitis.

Near the close of his life Koch was showered with honours from many parts of the world. Most notable of these was the Nobel Prize which he was awarded in 1905-1906. In the spring of 1910 at the age of sixty-seven, Robert Koch passed to his reward, and the world lost one of the greatest scientists of all time.

On one of his first scientific papers, the one on anthrax, Koch, as was the custom in his day, had placed a motto. It read "Numquam otiosus" which means "be never idle". This principle stands forth as the theme of Robert Koch's life and the secret of his memorable achievements.

THE UNIVERSITY OF TORONTO
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EDITORIAL

ABOUT THE ISSUE

THE publication of an entire issue devoted to Tuberculosis is unique in the history of the University of Toronto Medical Journal.

Despite the wondrous progress that has been made to prevent, and to cure this dreaded disease, the dedication of this Journal to the subject seems well within reason. True it is that the incidence of Tuberculosis in Canada has reached low proportions. It is equally true that some of the modern drugs have improved the course of the disease. But the results are far from complete satisfaction. Complications do arise: drug allergies, deafness, insensitive organisms, relapses, failure and disappointment of heralded agents. Among our weapons we have tuberculin tests, mobile X ray units, BCG, marvellous medical and surgical treatment, and efficient sanatoria. But notwithstanding all these facilities the facts are: (1) More beds than ever before have been devoted solely to the treatment of Tuberculosis yet all of these beds are filled, and there is still a list of hundreds awaiting admission (2) Every month of the year at least two hundred and fifty Canadians die of Tuberculosis (3) When Tuberculosis strikes, it in many instances depletes the productive wage earning years of a man's life and removes his parental influence from the family group.

The medical profession together with the cooperation of an understanding, sympathetic general public have made progress in the control of this disease which not so long ago carried great fear and emotional impact. As medical practitioners, we must continue in the purpose

of ideal control of this disease. We must strive for its early recognition and proper and adequate treatment. Lest we become complacent of our accomplishments and lest we slacken in our efforts we have dedicated this edition as a reaffirmation of purpose to this ideal.

The necessity for active cooperation of the public and the medical profession has been mentioned previously. Neither group alone can combat this disease successfully. It is necessary that the general public should be made to understand the nature of this disease and they should be informed adequately and often on the progress made for control. No one can deny the importance of public contribution in the form of hospitals and equipment and money for research. In a similar token the medical profession is responsible morally and actively for the practice of good medicine in all its aspects.

In this Journal, we are attempting within certain limitations, to depict in a general scope the nature of the contributions of each faction. We have planned the timing of this publication to be concomitant with the issuance of the first sales of the 1952 Christmas Seal Campaign. There is an article to explain the origin of Tuberculosis Cross Insignia and the origin and nature of the Christmas Seal Campaign. As well, there is an article noting the work of Sir William Gage and his founding of the Gage Institute.

The management of Tuberculosis is presented with a variance of articles on the work of Robert Koch, treatment in children by Dr. Gladys Boyd, surgical aspects by Dr. Joynt, and a special article from the Weston Sanatorium which explains treatment and latest research performed in that institution. We wish to indicate especially the article by the Department of Public Health of Ontario denoting the role of the private practitioner in Tuberculosis.

B.B.

AWARD WINNER

At a recent convention of C.A.M.S.I. held in Quebec City, the University of Toronto Medical Journal, Volume XXIX was awarded the Charles E. Frosst trophy, after having been selected as the best undergraduate Medical Journal in Canada.

The Frosst award is made annually and in the three years of its existence has been won twice by this Journal in competition with all other Medical school publications across the country. Such an honour will undoubtedly further create a favorable impression of the Medical Society and student body generally of this Faculty, whom the Journal has the privilege of representing.

Volume XXIX was the culmination of many hours of painstaking work by its staff, both those who have graduated, and those who are still members of the undergraduate body. Its success was due to their untiring work under the expert guidance of Dr. M. L. A. Auerbach, and we trust that the Charles E. Frosst trophy will be a constant reminder of their achievement.

CHEMOTHERAPY OF TUBERCULOSIS

A. W. CAPON, M.A., M.B., M.R.C.P.,*
H. S. COULTHARD, M.A., M.B.,*
K. F. DAVIS, B.A., M.D.*

The isolation of streptomycin from streptomyces griseus, and its antituberculous activity was reported by Waksman[1] in 1944, but the antibiotic was not in general use owing to difficulties in supply until 1947. During the last five years it has been subjected to intensive experimental and clinical investigation. Early reports soon indicated its limitations: firstly, that acute exudative tuberculous disease responded well but chronic fibroid tuberculosis was little affected; secondly, that toxicity was considerable; and thirdly, that the tubercle bacillus rapidly developed streptomycin resistance both in vitro and in vivo.

The clinical indications are now more clearly defined and will be referred to below. Toxicity and the development of bacterial resistance are associated with the dosage and duration of treatment. Initially 2-3 grams of streptomycin was given daily in divided doses at 3-6 hourly intervals. It was soon apparent that 1 gram daily in two divided doses was equally efficacious with less incidence of streptomycin resistance and less toxicity. Later it was found that a single daily injection of 1 gram was adequate but the most important advances have been the introduction by Lehmann[2] of para-amino-salicylic acid (PAS) and its subsequent use in combination with streptomycin, and the discovery that streptomycin may be given in a dose of 1 gram twice weekly without any loss of therapeutic efficiency.[3, 4] The use of the intermittent streptomycin + daily PAS regimen has largely overcome the bugbears of bacterial resistance and toxicity. The relationship of dosage to bacterial resistance is demonstrated in the following table (modified after Dye):[5]

Dosage	Patients with positive cultures at 120 days	% resistant
2 gm SM/d/120 days	108	62
1 gm SM/d/120 days	196	47
1 gm SM/d/42 days	88	25
1 gm SM/q3 days/120 days	118	35
1 gm SM plus 12 gm PAS/d/120 days	98	21
1 gm SM/2 q wk/ plus PAS 12 gm/d/120 days	40	5

The present day basic regimen at Toronto Hospital for Tuberculosis is streptomycin 1 gram twice weekly and the sodium salt of PAS 10 grams daily (expressed in terms of the pure acid). This is modified in certain cases as noted below. It has been shown that long

*The Toronto Hospital for the Treatment of Tuberculosis, Weston, Ont.

courses of combined streptomycin-PAS therapy are more efficacious than short courses, and continuous courses better than interrupted courses. At the present time the average length of course at Toronto is 9-12 months, and 12-18 months or longer for severe cases. With such prolonged treatment in view it is important to plan at the outset or during therapy any definitive medical or surgical treatment that is indicated.

Dosage of PAS

With regard to the dose of PAS, experimental work at Toronto Hospital showed that 2 grams daily failed to halt the rapid emergence of streptomycin resistance.[6] It is known that the bacteriostatic properties of PAS are proportional to the serum concentration, and there is some evidence that a dose of 18-20 grams daily will further delay the emergence of streptomycin resistant strains.[7] Should further work show that this larger dose is much superior to 10-12 grams daily, the increased incidence of gastrointestinal disturbance may be avoided by the use of Benemid, which will increase the serum concentration of PAS by 50% or more when given in a dose of 0.5 gm q6h. This is achieved by delaying renal excretion through interference with glycine-PAS conjugation.

Prognosis

The prognosis with combined streptomycin-PAS therapy is affected, as already mentioned, by the dosage and duration of treatment, by the anatomical structure of the diseased organ, the pathological character of the disease, and the age of the patient and of the lesion. In general younger patients respond better than the elderly. It is not to be expected that streptomycin will restore anatomical relationships which have been destroyed by caseation and fibrosis, and this aspect will be referred to again in the following sections.

Pulmonary Tuberculosis

Combined streptomycin and PAS therapy in pulmonary tuberculosis is indispensable in the majority of cases but must be combined with appropriate forms of treatment such as rest, medical or surgical collapse therapy and pulmonary resection. In the majority of cases we use the basic standard regimen, but this is modified for very acute cases and miliary tuberculosis. In the former group streptomycin 1 gram daily and PAS 10 gram daily is given for one month before proceeding with the intermittent streptomycin—daily PAS regimen. In miliary tuberculosis it is usual to give three months daily streptomycin and then a further nine months on the intermittent "combined" therapy, but each case is judged on its merits, as indeed is the duration of the treatment in any case.

The trend during recent years has been to extend the indications to include all forms of active pulmonary tuberculosis, including minimal cases and tuberculous pleurisy with effusion, though its use in the last two categories is still controversial, and the period of antimicrobial therapy is usually only 6 months rather than 9-12 months. It is difficult to think of any definite contraindications other than uncontrollable drug allergy or toxicity, disease that is essentially fibrocavitary, and irresponsibility on the part of the patient. It is in these last two groups that a high degree of bacterial resistance is most likely to occur. This constitutes a public health problem, but the risk of infection of others with completely strep-

tomycin resistant organisms is not as great as it would appear to be, and only 15 cases have been reported in the literature.[8]

From a pathological aspect streptomycin acts by reducing the bacillary population and thereby enhancing the natural processes by which tuberculosis heals: that is, by the clearing of perifocal exudative reactions, closure of cavities, encapsulation of caseous foci, fibrotic healing of miliary lesions and healing of endobronchial disease. The exudative component of a tuberculous reaction often clears completely but small areas may progress to caseation in spite of streptomycin therapy. In many cases chronic fibrocaseous disease was present before the disease was recognized. Following streptomycin therapy, therefore, there remains a fairly chronic type of disease characterized by cavities, nodules and scattered areas of varying "hardness" as shown by x-rays. Thin walled cavities may close, but thick walled cavities and large fibrocaseous nodules are rarely affected.

To summarize, following the administration of streptomycin and PAS varying degrees of resorption will occur and endobronchial tuberculosis will be controlled, allowing medical or surgical collapse therapy or surgical excision not otherwise possible.

Bone & Joint Tuberculosis

Treatment by streptomycin and PAS has not replaced the basic regimen of rest to the patient and to the diseased joint, but it has accelerated the process of arrest when used in conjunction with immobilization. The disappointing results of short term therapy used in 1947-50 seemed to indicate that only when the classical surgical procedures of arthrodesis, excision and bone grafting were used with streptomycin, would bone tuberculosis be arrested.[9] However, when drug resistance was virtually eliminated by the introduction of intermittent dosage and of PAS, and long term therapy could thus be applied, it gradually became apparent that many cases could achieve bony ankylosis without the aid of surgery, and others could be cured without complete loss of joint function. In some cases it has been possible even to retain a range of joint movement that is normal. At the Toronto Hospital the first three of these amazingly good results were obtained in 1950-51 by the use of streptomycin 1 gram and PAS 10 grams daily for six months, along with plaster casts and rest in bed. More recently, a dosage of streptomycin 1 gram twice weekly with PAS 10 grams daily has proved equally effectual and has permitted continuation of treatment for as long as 12-18 months. This greatly reduces the possibility of late recurrence of disease as it more nearly achieves sterilization of the tuberculous lesions. It is also less unpleasant for the patient. Tuberculous abscesses can be eliminated by closed aspiration of the pus followed by injection of 0.25 to 0.5 gm. streptomycin before withdrawing the needle, as local treatment. Abscesses may also be excised and closed with safety when the patient is having a course of streptomycin and PAS.

These excellent results rarely give advance notice of their coming during the first few weeks or even months of treatment. Lesions may continue to behave like active foci, but antimicrobial treatment and immobilization should not be abandoned. Ultimately a high proportion of cases may escape surgery, though destroyed joints which have healed with-

out bony ankylosis will require stabilization by arthrodesis. In the past two years over forty orthopaedic cases have received this intermittent therapy at Weston, seventeen having had a previous daily course, but six receiving semi-weekly courses from the beginning of treatment. For whatever type of lesion the treatment was given, all did well except three with chronic draining sinuses, one case of total paraplegia and one case complicated by purulent meningitis. Some are still on streptomycin therapy after 6-18 months indicating that improvement is continuing. Routine surgery called for 25 arthrodesis operations in this group, but it has been possible to dispense with eleven of these. Ten abscesses or sinuses have been cured, and two cases of miliary tuberculosis complicating early lesions in knee and spine and meninges have been cured without demonstrable impairment of the involved bones.

Lymph Node Tuberculosis

In tuberculous adenitis better results have been obtained by long term, intermittent streptomycin therapy with PAS, than on the former short term daily dosage. Local abscesses should be aspirated, and small doses of streptomycin injected into the abscess cavity. In this manner it is possible in early cases to bring about complete disappearance of the enlarged nodes without scar formation.

Tuberculosis of Kidney and Epididymis

The results to be expected from chemotherapy of genito-urinary tuberculosis depend to a great extent on the amount of tissue destruction and the location of the lesion. Streptomycin is fairly effective in healing shallow, inflammatory or ulcerative lesions of kidney pelvis, ureter and bladder wall. On the other hand an antibiotic can not be expected to restore normal structure or to replace tissue which has been destroyed and become caseous or has excavated.

This was clearly shown in a study which was carried out in this hospital early in 1948. The urine of certain patients whose pyelograms showed early x-ray changes became negative on T.B. culture after therapy in 50-60% of cases. However, when the x-ray showed evidence of ulcero-caseous disease the urine continued to be positive, although in some cases the cultures planted during treatment were negative. This was thought to be due to the presence of streptomycin in the specimens collected in sufficient quantity to inhibit growth of the organisms.

Some permanent improvement in bladder symptoms may be expected from streptomycin, especially when it is combined with excision of the diseased kidney within 3-6 months of the onset of urinary frequency. However, if the bladder capacity is markedly reduced by thickening of the bladder wall, the urinary frequency will change very little, but the severity of bladder pain and dysuria will be lessened due to clearing of the inflammation and oedema of the bladder wall.

Tuberculous epididymitis, which is usually associated with renal tuberculosis, responds in various ways to streptomycin. Sometimes the swelling subsides over a period of several weeks' therapy, leaving a small firm nodule. In other cases a scrotal abscess may form during treatment and the contents of the abscess will be discharged through a sinus in the skin. Chronic discharging scrotal sinuses, which may have been present for many months, have closed in six weeks of treat-

ment, especially if the granulation tissue deep in the destroyed epididymis has been curetted out thoroughly.

In the experimental years of streptomycin therapy of genito-urinary tuberculosis, 1 gram daily was given with PAS. Later the regimen was changed to dihydrostreptomycin 2 grams daily, but this was abandoned because of the occurrence of a few cases of permanent deafness, which appeared without warning several weeks after the completion of treatment. At present streptomycin is given 1 gram twice weekly with PAS 10 grams daily for 9-12 months.

Tuberculosis of Larynx and Intestine

These forms of tuberculosis are much less common than formerly, because they are usually found in patients with grossly positive sputum. If the pulmonary disease improves and the amount of positive sputum is reduced, symptoms of laryngitis and enteritis will subside in most cases. Best results are obtained by daily administration of streptomycin and PAS, for 4-6 weeks, followed by the usual intermittent twice weekly dosage.

Tuberculosis of Peritoneum and Female Pelvic Organs

While tuberculous peritonitis sometimes occurs in male patients, it is more common in females, in whom it is sometimes associated with pelvic tuberculosis. Long courses of antibiotic treatment (up to 12 months or longer) are being given and the necessity for excision of the pelvic organs should be considered during the course of treatment.

Toxicity of Streptomycin

The calcium chloride complex of streptomycin is considered to be the least toxic salt. It is less likely than the hydrochloride or sulphate to cause acute reactions but the incidence of chronic toxicity depends for the most part on the dosage and the duration of treatment. Toxicity may occur in the presence of renal impairment when normal doses are used. It is advisable, therefore, to check streptomycin blood levels when renal function is impaired. Acute toxic reactions include local irritation at the site of injection, urticaria, nausea, drug fever, and very occasionally a reaction resembling anaphylactic shock. The most serious and frequent toxic effect is on the eighth cranial nerve. Impairment of hearing, blurred vision, vertigo and ataxia result. Renal damage, fatty infiltration of the liver and blood dyscrasias are rare.

Dihydrostreptomycin, the reduced form of streptomycin, was once considered to be much less toxic. Experience has not confirmed this and it is apparently more liable to cause severe deafness than streptomycin, although there is probably little difference between the drugs when used on an intermittent basis. Dihydrostreptomycin has not been used recently at Toronto Hospital, except when acute sensitivity reactions occur to streptomycin, because several severe, delayed and permanent cases of deafness occurred following its use in 1950. Most of these cases received 2 grams daily over a 90 day period. Dihydrostreptomycin is less likely to cause pain at the site of injection.

Toxicity of PAS

Toxic symptoms such as nausea, anorexia, vomiting and diarrhoea are common, but rarely severe enough to warrant discontinuation of the drug. Skin rashes of an urticarial or erythematous nature are sometimes seen, and also drug fever. In general, although many symptoms and signs have been attributed to PAS

therapy the drug rarely causes serious toxic effects, and the mild toxic effects which do occur often respond to symptomatic therapy, or may be avoided by the use of a gradually increasing desensitizing dose.

NEWER DRUGS

Isoniazid

The preliminary reports from Sea View Hospital[10] on the use of isonicotinic acid hydrazide and its isopropyl derivative led to wild claims in the popular press. Animal experiments and in vitro laboratory studies have shown that these drugs have a high degree of activity against M. tuberculosis. Of clinical importance is the property of penetrating serous membranes much more readily than streptomycin and the power to pass through the cell membrane of macrophages which may contain viable tubercle bacilli, a property not shared with streptomycin. In humans the results of treatment in meningeal and miliary tuberculosis with isoniazid have been equal if not superior to those achieved with streptomycin and PAS.[11] (Streptomycin and possibly PAS should, however, be given in addition.) In other forms of tuberculous infection, however the position has not yet been clarified. A dosage of about 5 mgm./Kg/ day appears to be adequate and this is doubled in the first week or so of treatment of miliary and meningeal tuberculosis. Toxicity appears to be slight, and readily reversible when the drug is discontinued. Bacterial resistance develops rapidly. At Toronto Hospital we have treated about 70 patients with isoniazid alone in varying dosages; mostly they had far advanced disease and tubercle bacilli were already resistant to streptomycin. Results have not been dramatic but benefit has occurred symptomatically in most and radiologically in about 25% after 4-6 months therapy. Sputum conversion has not occurred in any case.

All new patients requiring antibiotic therapy are now receiving isoniazid in a dosage of 75 mgm. t.i.d. in addition to the standard basic regimen of streptomycin 1 gram twice weekly and PAS 10 gram daily. It is too early to assess the results of this treatment.

Viomycin

This antibiotic was isolated from streptomyces puniceus and streptomyces floridae in 1950 by Chas. Pfizer and Parke Davis, working independently. It was very toxic in early trials, and produced a high incidence of eighth nerve damage, as well as electrolyte imbalance, albuminuria and cylindruria.

This has been reduced by the use of the drug on an intermittent basis in a dosage of 2 grams twice weekly. Its use combined with streptomycin and PAS is still experimental. Viomycin may prove of value in the treatment of patients with streptomycin resistant organisms.

Amithiazone (Tibione)

This thiosemicarbasone was first used in Germany where it was considered to be a very effective antituberculous agent. Streptomycin was not available at the time for comparison. It is approximately equal to PAS in therapeutic efficiency. Toxicity is high, the bone marrow and liver suffering most. Bacterial resistance develops quickly and the drug is less efficient than PAS in preventing the emergence of streptomycin resistance.

Terramycin

Terramycin has antituberculous properties, and in a dosage of 5 gram daily

it will prevent the emergence of streptomycin resistant strains of tubercle bacilli to the same extent as PAS. Owing to its high cost it is not likely to be widely used.

Neomycins

These antibiotics are too toxic for use in humans, and it is unlikely that further research will lessen the severe ototoxicity which results.

SUMMARY

In this rapidly changing field of therapy, there are a few basic principles which should be emphasized—

1. Antimicrobial agents do not cure tuberculosis by themselves and cannot be used in place of rest.
2. The earlier the lesion is treated, the better will be the result.
3. Long term therapy gives the best results, if drug resistance is avoided.
4. Sensitivity to streptomycin can be retained by intermittent administration and by daily use of PAS.
5. Many cases still require collapse therapy, excisional surgery or joint fixation.

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SPECIAL INTERNESHIP

Arrangements are being made for special interneships designed to prepare doctors for general practice. The appointments begin July 1st, 1953.

The program includes four months in Paediatrics at the Hospital for Sick Children, four months in Obstetrics and Gynaecology at the Toronto General Hospital and four months in Medicine at the Toronto General Hospital, Wellesley Division.

These interneships are being offered to doctors who have completed at least one year on a rotation interneship. Application should be made immediately to Dr. R. C. Dickson, Wellesley Hospital, Homewood Place, Toronto 5, before November 21st, 1952.

SURGICAL TREATMENT OF PULMONARY TUBERCULOSIS

G. H. C. JOYNT, M.D., F.R.C.S.(C.)

History

The history of collapse therapy goes back to the time of Hippocrates when reference was made to the injection of air into the chest for therapeutic purposes. In the early part of the nineteenth century, James Carson of Liverpool carried out the induction of pneumothorax in animals and in 1821 he proposed applying these physiological principles to the treatment of pulmonary tuberculosis and saw the need to bring the lung "to a state of collapse by degrees only." Actually, an attempt was made to induce pneumothorax in two cases by Carson, but these were unsatisfactory due to pleural adhesions. His contribution received little attention until 1882, when Carlo Forlanini of Italy urged its use and performed the first pneumothorax in 1888. In 1894, Forlanini published his clinical experience with artificial pneumothorax in the treatment of pulmonary tuberculosis. After Saugman added the manometer for routine use in 1904, the principles and tools for pneumothorax were complete and a general popularization was begun about 1910 in America. In Canada, the first series of pneumothorax treatments for tuberculosis was published by Parfitt and Crombie in 1913.

The first thoracoplasty operation was done by de Cèrenville of Lausanne in 1885. Limited anterior costal resections were carried out. This was the beginning as well as the pioneer work of an active surgical interest in pulmonary tuberculosis. Subsequently, Brauer and Frederick removed the entire ribs from the second to the ninth ribs inclusive in one stage. This produced a sudden, tremendous pulmonary collapse and the operative mortality was prohibitive. Later, Wilms and Sauerbruch modified the paravertebral thoracoplasty which was carried out in one or two stages. The modern operation is usually a partial thoracoplasty involving only as many ribs as are required to collapse the lesion and is carried out in multiple stages. In Canada, the pioneer work in thoracic surgery was done by Dr. Edward Archibald of Montreal and Dr. Norman Shenstone and Dr. R. M. Janes.

Mechanism of Healing in Collapse Therapy

A number of different, and even contradictory hypotheses have been advanced, to explain the curative effect of pulmonary collapse. Forlanini gave a purely mechanical explanation, but the problem appears more complex and is still far from settled. The elastic relaxation in collapse therapy diminishes or eliminates elastic strain on diseased tissues thus enhancing scar contraction and collapse of cavities. Restriction of respiratory amplitude and the tortuosity of bronchi with collapse therapy tend to create conditions which prevent spread and influence healing of the disease. Relative tissue anoxemia and lymphstasis may also enhance fibrosis. These factors appear to contribute to the cura-

tive effect of the disease but many phenomena remain unexplained.

The choice of operation in the treatment of pulmonary tuberculosis may present a difficult problem and is usually decided after a conference of the medical and surgical staff. The results of treatment may be expected to vary with the experience of the medical and surgical team in the selection of the patient and the operation, as well as the operative technique, post-operative care and convalescence of the patient.

Artificial Pneumothorax

A satisfactory pneumothorax is an efficient method of treatment of pulmonary tuberculosis. It may be undertaken for the control of cavitation and progressive disease. A localized lesion is more amenable to pneumothorax treatment than a diffuse lesion since a local lesion may be selectively collapsed. Pneumothorax may be carried out along with other surgical procedures on the contralateral side or on the same side. The chief contra-indication for pneumothorax therapy is tuberculosis of the bronchus and all cases of pulmonary tuberculosis are bronchoscoped before collapse therapy is undertaken. In many cases, pneumothorax cannot be carried out because of pleural synthesis or it is rendered inefficient because of adhesions. Intrapleural pneumonolysis may be used to divide adhesions but if the adhesions are extensive or a cavity is close to the surface of the lung, a tuberculous empyema may follow. Although an inefficient pneumothorax may improve the patient's symptoms, a tuberculous effusion or empyema may occur. These and other complications have led to a more restricted use of pneumothorax therapy in recent years.

Phrenic Nerve Paralysis

The phrenic nerve is probably the only motor nerve of the diaphragm and the paralysis of this nerve causes elevation of the diaphragm with pulmonary relaxation. At operation the phrenic nerve is approached in the neck above the clavicle and is usually crushed, thus giving a temporary paralysis. The operation may be repeated several times if paralysis of the diaphragm is indicated in the treatment of the disease. Phrenic nerve paralysis is used in lower lobe lesions and may be carried out as an accessory operation in collapse therapy. This method is of limited value in the treatment of pulmonary tuberculosis.

Artificial Pneumoperitoneum

This form of treatment has been used a good deal in recent years. The collapse of lung tissue that may be produced is limited but the method is free of most of the complications associated with pneumothorax. Air is introduced into the peritoneal cavity and this causes elevation of the diaphragm and a decrease in the respiratory excursions of the diaphragm. This form of collapse therapy has been used in bilateral disease and in those cases where other forms of therapy are contra-indicated and it is used as a temporary procedure. A phrenic nerve paralysis may be used in conjunction with pneumoperitoneum in order to improve the collapse of the lower lobe. The relaxation and collapse from artificial pneumoperitoneum is not as efficient as many of the other forms of collapse therapy.

Thoracoplasty

Thoracoplasty is a major surgical procedure which provides a permanent and

selective collapse for pulmonary tuberculosis. The ribs are removed subperiosteally over the diseased lung and the operation is tailored to the extent and position of the lesion. The operation is done in stages through a postero-lateral incision about the scapula. In this way the patient does not suffer too much shock or cardio-respiratory embarrassment. In the first stage the third and second ribs are removed first, thus providing adequate exposure for the removal of the first rib which is technically more difficult to remove. Subsequent stages are done at intervals of fourteen to twenty-one days. A patient may tolerate a bilateral thoracoplasty but sufficient lung tissue must remain for respiratory function. As thoracoplasty is a major surgical procedure, the patient must be in moderately good general condition with adequate cardiac and respiratory reserves. It is most useful in upper and mid-lung lesions and is not infrequently carried out as a primary collapse procedure. Thoracoplasty should rarely be carried out in the presence of bronchitis of the main stem bronchus. With a low mortality and morbidity, this operation has proved to be a very successful form of collapse therapy.

Pulmonary Resection

There has been a great deal of discussion recently regarding pulmonary resection in tuberculosis. Excision is tolerated better and is much safer since the advent of the anti-microbial drugs but tuberculosis is a systemic disease similar to syphilis and cannot be cured by excising one demonstrable lesion. Although the complications with resection are greater than with thoracoplasty, there appears to be certain definite indications for excision therapy as outlined by Dr. Janes in the Macarthur Lecture in 1950.

(1) Persistent cavity after collapse therapy.

(2) Non-collapsible disease (usually with cavitations). This includes all lower lobe cavities.

(3) Bronchostenosis.

(4) Widespread tuberculous lesions (usually associated with multiple cavitations).

(5) Tuberculoma, a solid, tumor-like lesion.

(6) Tuberculous bronchiectasis and atelectasis.

The place of segmental resection which has been strongly advocated by many surgeons in Europe and some in America, is still in doubt. Recent follow-up studies have not been as encouraging as anticipated. It is difficult to do local excisions of tuberculosis, except when dealing with tuberculomas, without dissecting through tuberculous tissue and in consequence involving an unwarranted risk to the patient.

There are lesions for which the choice of treatment is optimal. In some cases where the tuberculosis is stabilized by adequate rest in bed, there may be little hope of cure by collapse therapy. The outlook in some of these cases may be changed by pulmonary resection. In any case, the surgeon's aim must be to control the tuberculosis with maximum conservation of pulmonary function.

Decortication is an operation that is occasionally performed in the treatment of some of the complications of pneumothorax therapy. In some cases of tuberculous empyema, the fibrous envelope about the empyema cavity may be stripped off the visceral and parietal

pleura. This allows the lung to re-expand and obliterate the pleural space. Decortication may also be used at the conclusion of pneumothorax therapy when the lung fails to re-expand due to the fibrosis of the visceral pleura.

With the development of these practical surgical procedures and the advent of specific therapeutic measures, marked advance in the treatment of pulmonary tuberculosis has occurred. It is to be hoped that this progress continues.

WHO AM I?

(Listed below are some pertinent facts about men who have contributed to the advance of medical science. Can you name them?)

1. *German pathologist* 1841–1902; professor of pathology at Berlin; emphasized that the cell should be studied as the fundamental unit in pathology; noted for his discovery of luecocytosis, his original description of leukemia, his recognition of infective and other types of emboli. He also made a number of contributions in the field of anthropology.
2. *Canadian physician* 1849–1919. Much of his life spent in the U.S.A. and Great Britain; carried out an early research on the blood platelets; gave original accounts of the syndrome polycythemia vera; wrote classical descriptions of chorea, angina pectoris and the cerebral palsies of childhood. He founded the Quarterly Journal of Medicine; interested in medical history and teaching.
3. *American surgeon* 1869–1939. Professor of Surgery Harvard University; made important contributions to the physiology of the pituitary gland. He published among other works Consecratio Medici.
4. *German bacteriologist* 1843–1910. Professor at University of Berlin; noted for his original methods of obtaining pure cultures of pathogenic bacteria; discovered the macro organism of Egyptian ophthalmia. He believed at one time that he had found a cure for tuberculosis.
5. *Hungarian obstetrician* in Vienna 1816–65—a long struggle against puerperal fever. Bitter opposition from colleagues at times mounted to persecution from which his mind became unhinged. He died insane.
6. *A Frenchman* 1822–95. Interested in the beer and wine industry; also interested in worms. Once a Professor at Strassbourg; disproved the theory of spontaneous degeneration.
7. *English Biologist, physiologist, paleontologist, and comparative anatomist* 1825–95. Fullerian professor of physiology at Royal Institution London. Supported Darwin's theory publicly with vigor and eloquence. The humanities will remember him for 'Science and Culture' and 'Evolution and Ethics.' He furnished evidence for evolution from his paleontological studies.

Answers on p. 89.

C. A. SMYTHE.

CHILDHOOD TUBERCULOSIS

GLADYS BOYD, M.D.*

Tuberculosis in children differs from that in adults in that the changes produced by the invasion of tubercle bacilli are the response of virgin soil to this infection. The resultant pathological picture was recognized even before the discovery of the tubercle bacillus. In 1876, Parrot announced to the Société du Biologie de Paris his observations on the association between the tracheo-bronchial lymph gland disease and the pulmonary lesion. These findings resulted in the formulation of Parrot's law, which stated that in the child, there is no tuberculous lesion not reflected in the adjacent lymph glands, and conversely there are no changes in the glands without analogous ones in the lungs. Many European workers confirmed Parrot's work but it remained for Ghon, working in Viennese hospitals, to elaborate on these findings. He described the initial lesion produced by the tubercle bacillus, and his name has since been given to this lesion known as the primary lesion or Ghon tubercle. It might not be amiss in a Toronto University Journal to mention that Dr. Harold Parsons, long a teacher here, was among the first to promulgate Ghon's teachings and its clinical implications in the fight against tuberculosis in children on this continent. Another Toronto graduate, Dr. F. M. McPhadean, published one of the most comprehensive articles on the subject four years after Ghon's book was published.

Since 1882 when Koch discovered the tubercle bacillus, it has been known that the disease was produced by a specific organism. It was soon recognized that the infecting organism varied in different species. Debate long raged as to the pathogenicity of one species of organism for different animals and man. It was proven that three species, human, bovine and avian could produce disease in man. More recently the rodent variety, the vole bacillus, has shown possible protective qualities against the tuberculosis in man.

Human and bovine organisms produce most of the disease in man. Mammalian types produce the same pathological picture. Avian bacilli can infect man, but neither the initial lesion nor course of the disease is the same. Brief reference is made to it here, and then it will be dismissed from this discussion. It is acquired by handling infected material, or by eating infected eggs or meat. The latter may be found in animals living in infected barnyards. As in the chicken, primary nodules are often found in the liver. They are large necrotic (caseous) nodules. Clinically it may resemble abdominal Hodgkin's disease. It sometimes produces large livers with chronic ascites. Atypical cervical adenitis may occur. Polyarthritis without bony destruction has been seen. When suspected, tuberculin tests must be done with avian tuberculin as it is a relatively specific reaction.

Pathogenesis

Mammalian organisms produce identical lesions with a different locale de-

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pending on type. Human bacilli are aspirated, so locate in the respiratory tissues, whereas bovine entering by ingestion go to the gastro-intestinal tract. Human bacilli settle in the periphery of the lung. Conceivably they might be so few in number, or the host's resistance so great, that they are killed and nothing further happens. Usually they survive. The initial reaction of the body to this invasion is the foreign body reaction stimulated in this instance by the waxy lipid coating the bacteria. Cells in the vicinity (monocytes) form aggregations about the material and thus produce the elementary tubercle. Lymphocytes appear in the periphery. The essential cells are epitheloid, but not derived from epithelium. These cells flatten out as pressure increases and take on the characteristics of fibroblasts which produce an investing membrane. Giant cells are seen in the centre of the nodule. They probably arise from the epitheloid cells either by fusion of several of them, or from cells which were unable to complete division into daughter cells because of the tubercle bacilli they engulf. This lesion is nodular, discrete and non-proliferative. It develops slowly requiring about three weeks to complete. The changes produced are unaffected by allergy.

The tuberculo-protein now enters the picture and produces allergic responses. These changes are rapid, proliferative, diffuse and inflammatory. Caseation is produced by this sensitivity response. It may ensue quickly.

The infection now travels along the lymphatics to the glands draining the area and the second component of the primary complex, caseous glands, is produced. The compression of the lymphatics on either side of a bronchus may produce radiographic evidence of localized atelectasis, often called epituberculosis.

The subsequent development of disease depends on what happens to the primary focus. This may heal completely by calcification and be apparent later by a small peripheral lesion plus calcified mediastinal glands. Such healing may occur without ever producing any symptoms or signs of illness in the patient and confer on him a degree of immunity. The reaction about the subpleural lesion may be extensive and cause local disease. This may be purely exudative or may proceed to caseation and even cavity formation. The glandular reaction may be so great that large caseous masses, slow to heal, are produced, and remain a potential danger. Both the peripheral lesion and the gland may rupture into a blood vessel or bronchus and disseminate disease to other parts of the lung or to any part of the body. Many organisms entering the blood stream cause miliary tuberculosis and possibly meningitis. A lesser number cause so-called surgical tuberculosis or a tuberculoma in the brain.

Diagnosis

The criteria for the diagnosis of tuberculosis disease in children may be discussed under five headings considered in the order of their importance.

1. The *history of exposure* to human tuberculosis, or the ingestion of infected milk is of prime importance. In the young infant, a positive history is tantamount to a positive diagnosis. Congenital tuberculosis does occur but is so rare as to be almost only of academic importance. All children exposed to the disease should be followed at least six months after the contact is interrupted

before declaring them free from infection.

2. *Tuberculin sensitivity* is next in importance. It requires from three weeks to three months from the time of infection to become positive. It has become so firmly established as to be axiomatic, that tuberculin sensitivity develops only if focal infection is present. Once established, it usually remains present as long as free tuberculo-protein is in the body. It may become negative if the lesion becomes completely sealed in by calcium. It may be depressed temporarily by infections, particularly measles or in an overwhelming acid fast infection.

Various means of testing tuberculous sensitivity have been used. The two methods currently used are the patch test and the intradermal one. The first undoubtedly serves a purpose in surveys but its value is minimized but the fact that it produces both false positive and false negative reactions. The intradermal test is not only more reliable but permits a variation in the amount injected. Thus in an individual suspected of having disease and showing a negative response, larger doses may be used. The initial testing amount is usually the largest safe dose in the community. Highly tuberculerized areas call for smaller doses if necrotic reactions are to be avoided. On this continent 1/20 mgm. is most often used. This is obtained by injecting intradermally 1/10 cc. of a 1–2000 dilution of old tuberculin. This may be increased to 1/2 mgm. and to 1 mgm. if the first test dose is negative. The reaction is read in forty-eight hours. Five millimetres or more induration is a positive test. The results are best recorded as

$$\frac{\text{millimetres of induration}}{\text{millimetres of redness}}$$

A positive test means that the individual has been infected with tubercle bacilli, but does not mean he has clinical disease, except in infants under six months when a positive test usually means active disease. Many have considered the size of the reaction as significant of the severity of the infection and indicative of the prognosis. This has not been proven. In children large reactions usually indicate recent infection or reactivation of old disease.

3. The *clinical course* is often of diagnostic importance. It may not be, as advanced disease may be found in an apparently healthy child. Those symptoms considered characteristic of adult disease, cough, hemoptysis, and night sweats are more suggestive of non-tuberculous disease in the child. Cough may occur but is seldom the presenting symptom. It may be brassy and dry from compression of the trachea or moist and irritating due to tracheo-bronchial ulceration. One can tour an institution full of tuberculous children and seldom hear the 'tussic blast'. Fever is probably the most universal finding. Temperatures must be taken rectally in those six years and under, and well controlled oral ones in older children. It must be taken at least four times in the day. A variation of two degrees or more in the day means fever, regardless of the peak temperature. High swinging temperatures usually indicate miliary disease or meningitis. Such fever may also occur in the incubation stages of the disease. "Wheezy" breathing is very suggestive of bronchial ulceration. This should always be considered as a possibility in very young infants with an asthmatic type of breathing. Fatigue is common. Stationary or slight weight loss is not uncommon. Marked

weight loss or deterioration in health usually signify advanced disease.

There are certain diseases seen that are considered most often due to tuberculous allergy in children. These are phlyctenular conjunctivitis, erythema nodosum and certain cases of pleurisy with effusion. They are sufficiently suggestive of tuberculosis that this must be ruled out.

4. The *X-ray* provides the next most important evidence of tuberculous infections. Miniature films are unsatisfactory. Both P.A. and lateral projections should be made. Failure to pay attention to the mediastinal shadow often leads to a wrong interpretation of the X-ray. This area and the hilar regions should always be studied. All types of parenchymal lesions may be seen. Extensive localized shadows due to collapse are common. Atelectastic areas may also appear because of obstructed bronchi from granulations and ulcers. Extensive reactions about primary lesions and caseous pneumonia are common. Cavities may be seen. Persistent extensive collapsed areas may be seen due to bronchiectasis secondary to bronchial obstruction. Miliary lesions are not apparent in the film for some weeks after the onset of suggestive symptoms.

5. *Physical signs* are of doubtful value especially in young infants. Increased dullness over and to the side of the manubrium indicates mediastinal gland enlargement. Prolongation of whispered voice sounds between the D 3 and 6 indicates posterior mediastinal gland enlargement. Poor air entry in a localized area is frequently noted. Either localized or general asthmatic-like sounds are indicative of tracheo-bronchial ulceration and obstruction. In older children all varities of adventitious sounds and altered breathing may be heard when caseous pneumonia and cavitation are present.

Treatment

Prevention is still the best therapy. This would be best accomplished by prompt segregation of all infected persons, or removal of children from them. This often proves impossible. Compulsory pasteurization of milk has reduced bovine infections to a bare minimum. Utopia has not been reached when such measures are always obtainable so some means of immunization offer the next best solution. B.C.G. vaccination is the best such measure offered. It has been proven irrefutably that such material is innocuous. Debate still rages as to its effectiveness. There is, however, abundant proof of merit to it even if it is not 100% effective. The United Nations teams have vaccinated millions in Europe under anything but ideal conditions but are able to report that serious infections do not arise in the vaccinated even if they were infected before vaccination. Wahlgren can report a complete absence of tuberculous meningitis for six years in Sweden where such vaccination is compulsory. In the same period, there have been 150 cases at the Sick Children's. Here we have been impressed by the lack of disease in those vaccinated and by its protective action in families with tuberculosis, where the vaccinated child alone has remained free of disease.

The general care still involves long bed rest. The modern trend to ambulation of all patients has penetrated to this field, but on the whole, comparative results favour the old-fashioned way.

Nutrition is important but old-time stuffing is taboo. Good meals with an

abundance of Grade A protein, eggs, milk, fresh fruits, and vegetables is imperative. Certain vitamins are useful. Extra D helps calcify lesions when abundant food calcium is used. Extra C in citrus fruits is beneficial. Vitamin A possibly helps avoidance of infections. B compounds, especially B_1 and B_{12} stimulate the jaded appetite. Iron is often needed for anaemia. Other drugs, except the new specific drugs, are seldom needed.

Specific Drugs

New antituberculous drugs have appeared in great profusion in recent years. Space will not permit discussion of all of them, nor full discussion of any. Five only will be mentioned and their usefulness indicated.

Streptomycin still remains the drug par excellence. Most of the others possess some antibacterial effect but serve best by enhancing the powers of the streptomycin. This is best accomplished by starting them simultaneously with the streptomycin. Streptomycin may be given continuously or in interrupted courses. Both methods have their proponents. Continuous administration seems best to us. It is given in half gram doses twice a day for three to six months depending on the severity of the disease. Large doses seem only to produce more toxic symptoms without correspondingly greater benefits. Its use for more than six months appears illogical as practically all the organisms are insensitive by then. Streptomycin should not be used when other means will accomplish the cure or where it is ineffective as its unwise use may deprive the patient of its real value subsequently.

Streptomycin is indicated in the following:

1. All meningitis cases.
2. Most miliary cases.
3. Caseous pneumonia not responding to other treatment.
4. Preoperatively for pulmonary resections and fusion of tuberculous bones and joints.
5. Chronic tuberculous sinuses.
6. Severe corneal ulceration following neglected phlyctenular conjunctivitis.

Streptomycin is contraindicated:

1. As a protective measure in infected but not diseased individuals.
2. Uncomplicated primary lesions.
3. Cervical adenitis.
4. Massive mediastinal glands not complicated by disseminated disease.

The sulphones were of proven merit in animal tuberculosis before streptomycin was discovered. In adequate dosage they were too noxious in humans. They are useful in smaller doses as an adjunct to streptomycin. In children they cause too much anorexia and skin irritation whereas the next drug accomplishes its purpose without doing this.

Paraminosulphacylic acid (P.A.S.) was discovered and used by the Swedes contemporaneously with the discovery of streptomycin. It was not used on this continent until later. It is of very real value in keeping the tubercle bacillus sensitive to streptomycin. Small doses 6-8 grams a day are used in children. It it also useful in a 10% solution as a dressing for brokendown glands or tuberculous ulcers. It may be injected into softened infected glands with benefit.

Thiosemicarbizone originated in Germany and is still more popular in Europe than on this continent. We found it useful but its toxic properties necessitate

much laboratory work to make sure harmful effects are not likely.

Isonicotinic acid and its allied compounds are too new to assess their full value as yet. They undoubtedly have some very real value but not sufficiently proven to use in treating meningitis or some miliary cases unless combined with streptomycin. They are relatively nontoxic, and may be taken orally. They usually give the patient a sense of well-being and exert profound effects on weight gains and falling sedimentation rates and temperature.

Biological Products

The only one of these considered is the use of tuberculin. This has been given in some form or other since the tubercle bacillus was discovered. Many failures have attended its use, but there are some ways in which it is of sufficient merit as to warrant continuation of its use. They are as follows:

1. Tuberculous meningitis which does not respond adequately to drugs alone may be helped greatly if it is given as well. Its use with streptomycin in severe cases was first suggested by the Oxford group, Cairns, Smith and Vollum. It proves effective in breaking down the collar of tuberculous tissue at the base of the brain. This not only blocks the cerebrospinal system but cradles the tubercle bacilli safely from the drugs, so its destruction is of real help. It need only be used in severe cases which needed frontal burr holes and intraventricular administration of drug. Parke Davis protein derivative in dilute solution is used.

2. Certain extrapulmonary types of tuberculosis may be cured by it. They are:

   a. Phlyctenular conjunctivitis.
   b. Dactylitis.
   c. Small tuberculous sinuses.
   d. Tuberculous adenitis after removing focal infections.

Tuberculous Meningitis

In conclusion, let me say a word about tuberculous meningitis. It has now been abundantly demonstrated that this hitherto always fatal disease can be cured in a large proportion of patients and many such are completely restored to normality. This can only be accomplished when they are diagnosed early and not nearly dead before therapy is given. Space will not permit a detailed discussion of their treatment but will possibly allow me to indicate a few facts which might lead to correct diagnosis. The disease has already been present 3-4 weeks when meningeal signs prevail. Early symptoms are anorexia or vomiting, irritability and fever. About 25% have abdominal pain often of such severity that appendectomies are considered. Drowsy periods succeed the irritability. Potential cases are any tuberculous child particularly when symptoms follow measles, and all miliary cases. The early physical signs are usually only tache cerebral, pain on attempting to do a Kernig and quite probably a large spleen. Spinal fluid is positive early. All cases of miliary tuberculosis are suspect and should have punctures done.

Wouldst thou be a master? First be a baccalaureate; then a doctor; then become an experienced and learned man so canst thou settle down to the benefit of the sick as a medical practitioner.

Paracelsus

THE PRIVATE PHYSICIAN IN THE CONTROL OF TUBERCULOSIS

S. A. HOLLING, M.D.*

The private physician without question, is the single most important factor in the control of tuberculosis and it is around him that all phases of the preventive programme should be built. The physician holds an unparalleled position in the community to make his influence felt in all matters pertaining to the control of this disease. In so far as he becomes (through experience) more efficient in the art of practising medicine, his contribution becomes that much greater.

The problem of tuberculosis presents a challenge to the physician requiring the broadest application of his art in the truest sense. Because of the peculiar nature of the disease with its widespread socio-economic effects, the physician has to be much more than a diagnostician. He not only has to understand the many factors which influence the disease, but above all, he must have a sympathetic understanding of what the disease means to the patient, his family and friends. In no other disease do we have such an impact on the sensibilities of the patient who has to be informed that he has active tuberculosis. How this situation is handled has a significant bearing on the future welfare of the patient. Here comes into play those intangible values of proper physician-patient relationship which, if properly applied, mean so much.

Great advances have been made during the past 25 years in the control of tuberculosis. This progress is reflected in the rapid growth of diagnostic and treatment facilities which has resulted in a dramatic reduction in deaths from tuberculosis. For instance, the death rate from tuberculosis in Ontario for 1951 was 12.6 per hundred thousand population, the lowest in the history of the Province.

The advent of antibiotics along with improved surgical techniques has accelerated the decline in mortality. This has tended to create an undue sense of security and becloud the true significance of morbidity. It is a fallacy to assume that a comparable decline in the prevalence of the disease has taken place. It is not unexpected that there might be a tendency on the part of some to err in the belief that because of the comparatively low death rate, tuberculosis is no longer a problem and therefore neglect to bear it in mind when making a diagnosis. The possibility of tuberculosis always should be considered as it still remains one of our major health problems.

In the past, tuberculosis mortality could be relied upon as a reasonably satisfactory index of the tuberculosis problem. Because of the changing picture this is no longer the case.

There are certain facts, which do give us some knowledge as to trends in morbidity such as the number of new active cases reported and the number of first admissions to sanatorium. It is particularly significant to know that while there has been a rapid decline in the death

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rate, the number of new cases admitted to sanatorium over the past several years shows little change. One must, however, take into consideration the greater availability of treatment beds, the expanded case finding programme and the increase in population. It is not unreasonable to believe that these factors have favourably influenced the true morbidity rate. The fact, however, that just as many active cases are being discovered should make us realize that the problem still is far from solved.

The physician now has at his disposal many aids in the diagnosis of tuberculosis —unexcelled x-ray facilities at no charge to the patient, free chest clinics, free laboratory services. In addition there are extensive programmes in effect for mass x-ray surveys on a community and industrial level and routine chest x-ray examination of special groups. The discerning physician will judiciously use these facilities as aids in his handling of the patient rather than pass the responsibility of diagnosis entirely over to other hands. The results will be a source of gratification in the realization of work well done.

A brief description of the diagnostic facilities at the disposal of the physician would be helpful at this time.

Adequate facilities for the examination of known cases of tuberculosis, their contacts and persons suspected of having tuberculosis, are basic to a well organized preventive programme. They should be free to the public, easily accessible and held with sufficient frequency at regular intervals to meet the needs of the community. We are fortunate in Ontario in having a comprehensive service of this type covering all sections of the Province.

There are now some 266 individual clinics conducted in 251 different centres throughout the Province. In 165 of these clinics, Christmas Seal Committees pay the cost of x-rays and medical supervision, and in 38, part of the cost. The Provincial Department of Health also provides a free service in 55 centres in addition to medical supervision for 34 of the clinics sponsored by local voluntary tuberculosis associations.

The importance of the chest clinic is illustrated by the fact that 57 percent of all new cases admitted to Sanatorium come through this agency.

Unsuspected tuberculosis in the apparently healthy general population is the essential core of our problem. How best to find these cases early presents a task of great magnitude as the attack must be made from many angles. A variety of methods is required of which the mass x-ray survey is a major effort. Its value both from the educational and case finding standpoint remains undiminished. During 1951, a total of 521,000 individuals were examined and 299 cases of active tuberculosis found in surveys conducted by the Provincial Department of Health, Gage Institute (National Sanitarium Association), Niagara Peninsula Sanatorium and the Ottawa Health Association (Maycourt Chest Clinic). This represents one active case for every 1,742 persons x-rayed. Sixteen percent of all new cases admitted to sanatorium in 1951 were found because of mass surveys.

There are certain special groups such as new employees in industry, food handlers, hospital employees, new Canadians, etc., which require special attention because of certain factors which make tuberculosis more of a problem in these groups.

The co-operation of the private physician is essential to the success of these various group screening programmes. It is to his interest as he receives reports of abnormalities found in the chest film of

his patients on which he is expected to act. It is only natural that he should be concerned with anything having to do with the welfare of his own patients.

A large segment of the population—approximately 14%—enter public hospitals annually. The high incidence of tuberculosis in this easily accessible group, as well as among hospital employees coming in contact with patients, had been demonstrated by pilot studies in Canada and the United States. In view of these known facts the Department decided to utilize funds from the Federal Tuberculosis Grant to place special x-ray equipment for taking admission miniature chest x-ray films in public general hospitals having an annual admission rate of 1,200.

Special x-ray equipment has been provided in 108 hospitals to date at a cost of over $900,000. The smaller hospitals (thirty-seven in number) have been subsidized to take standard size films using their existing equipment. Only eight public hospitals are not engaged in the programme because of shortage of staff and space limitations.

The importance of the tuberculosis control programme in general hospitals is indicated by the fact that twenty-one percent of patients admitted to sanatorium for the first time during the past year (pulmonary and extra-pulmonary) had been treated in general hospitals just prior to admission.

The value of the programme depends upon two main factors—

1. The coverage, i.e., the percentage of patients given admission chest film,
2. The extent to which the recommendations of the radiologist in respect to the need for further investigation are implemented by the attending physician, in order that a definite diagnosis may be established.

The follow-up investigation recommended by the radiologist is as important as the coverage. This is the direct responsibility of the attending physician, whether the patient is private or public. Here again the effectiveness of the programme is dependent upon the interest and action taken by the physician.

The admission chest x-ray programme has added another diagnostic lead which is made easily available to physicians. It has contributed to an improvement in diagnostic standards which has benefited the physician and the patient in addition to the hospital and staff.

Free facilities for the examination of specimens such as sputum, pleural effusion, spinal fluid, etc. are available, there being seventeen Provincial and subsidized district laboratories in Ontario. Every physician would do well to keep on hand a supply of sputum containers for use as the need arises. It is sometimes surprising what a routine sputum examination will disclose in cases of unexplained cough.

Tuberculin tests for differential diagnosis, might be done much more frequently. At all ages negative tests rule out tuberculosis, except in a few rare fulminating types. The younger the child showing a positive tuberculin reaction the more likely is the source of the infection to be found in the family or close contacts. Tuberculin solution for intradermal testing is supplied free of charge.

Once a diagnosis of active tuberculosis has been made, the question of treatment arises. This only can be properly undertaken in a sanatorium by specially trained workers. A word of caution—doctors are wise if they are not too specific about prognosis. They should

hesitate to express opinions as to the probable length of stay in sanatorium, or the character of the treatment. This can be damaging to reputations.

Canada is fortunate in having unexcelled treatment facilities. In Ontario there are fourteen sanatoria and the fifteenth will be opened shortly in Sudbury. In addition, there is a special section of 600 beds at the Ontario Hospital, Woodstock for the care of mentally ill patients suffering from tuberculosis. The Indian Medical Services also has two hospitals and the D.V.A. has a section of 105 beds at Sunnybrook Hospital devoted to the treatment of veterans. Ontario will have a total of 5,235 beds from all sources for the treatment of tuberculosis when the new sanatorium at Sudbury and the new building of the Royal Ottawa Sanatorium are opened. It is of interest to note that the sanatoria in Ontario are not government institutions but are operated by self-governing boards of directors.

The Ontario Provincial Government pays the basic sanatorium maintenance costs. While a charge may be made to patients provided financial embarrassment does not result, very few patients are called on to meet this expense.

The Mother's Allowances Commission financially assists mothers and children if they are in need of help while the head of the family is undergoing treatment. After a patient leaves sanatorium, post-sanatorium care is provided if such is required by the municipality in which the patient has legal residence until such time as it is safe to return to a gainful occupation. In the case of patients residing in unorganized territory, the Government assumes this obligation. In the event pneumothorax or pneumoperitoneum treatment must be continued, no charge is made the patient. The Provincial Department of Health reimburses specially qualified physicians who have been authorized to give the refills. Such facilities are available in seventy-seven centres.

In no other disease is so much help given to the afflicted or are so many aids available to the physician in the detection of tuberculosis. There has been widespread public interest in the problem of tuberculosis in this country for many years and the voluntary contribution to the fight against tuberculosis has been outstanding. We owe a great debt of gratitude to the Canadian Tuberculosis Association, its affiliated Provincial and local tuberculosis associations and their many thousands of enthusiastic lay workers. The public contributed $731,000 in the 1951 Christmas Seal sale campaign in Ontario; most of which was used to provide free diagnostic services. The menace of tuberculosis can be overcome only by close teamwork between all those interested in the welfare of the public.

The words of Sir William Osler written in 1909 at the end of the section on tuberculosis in his "Principles of Medicine" are as pertinent today as they were at that time—

"A last word on the subject of tuberculosis to the general practitioner, the leadership of the battle against this scourge is in your hands. Much has been done, much remains to do. By early diagnosis and prompt, systematic treatment of individual cases, by the prompt recognition of contract cases, by striving in every possible way to improve the social condition of the poor, by joining actively with the local and national anti-tuberculosis societies, you can help in the most important and the most hopeful campaign ever undertaken by the profession."

CASE REPORT

JAMES K. MURRAY, 5T3

M.D., a sixty-three year old married white woman was admitted to hospital complaining of lassitude, shortness of breath and loss of forty pounds in weight over the past year.

H.P.I. Seven months previous to admission patient was involved in a motor accident. An X-ray examination had shown that four ribs were fractured on the left side. Although the chest was strapped, four weeks later fluid developed on the left side of the chest. It was examined and found to be sterile. A diagnosis of an ovarian cyst was also made. Gynaecological examination revealed a large hard mass in the abdomen and a smaller pelvic mass. Diagnosis at this time was

(1) Ovarian cyst.
(2) Uterine fibroid.
(3) Left pleural effusion.
(4) Some ascites?

Physical Examination

Patient appeared to have lost considerable weight recently. A large pleural effusion was present on the left side displacing the trachea and heart to the right. A hard central tumour could be felt in the abdomen extending to the umbilicus. There was slight dulness in the flanks.

There was no pain, cough or sputum. The heart was of normal size and there were no murmurs. The arteries were not thickened but B.P. was 220/120. The urine contained no sugar or albumin.

At this time the diagnosis of malignant ovarian tumour with ascites and pleural effusion was made.

Progress Note:

One week after admission 56 oz. of clear fluid was aspirated from the left pleural space. The predominating cells present were lymphocytes, but red cells, endothelial cells, and polymorphonuclears were also present. There were no tubercle bacilli found on culture or guinea pig inoculation.

Two weeks later the abdomen was opened and the tumour removed. No secondaries were seen and the pathological report was ovarian fibroma.

Three weeks later 40 oz. of blood-stained fluid were aspirated. Red cells endothelial cells and lymphocytes were present but the culture was sterile.

Comment:

In 1892 Lawson Tait reported the case of a thirty-six year old single woman who complained of abdominal swelling, cough, shortness of breath, and night sweats, with profuse expectoration of much black-coloured material. A massive left pleural effusion and a solid tumour moored in the pelvis, but floating in the ascites fluid, were also found. A right pleural effusion followed and a diagnosis of malignant disease of the peritoneum with secondary pleural involvement was made. Two weeks later 80 oz. of yellow fluid were removed from the left pleura and eleven quarts of fluid were removed from the abdomen. During the following

year the abdomen was tapped thirty times yielding eight to fourteen quarts in each occasion. The pleural effusion did not recur and thirteen months after the onset of the illness, the abdomen was opened and a two pound ovarian fibroma was removed with subsequent restoration of health.

Meigs describes three cases with similar histories which had been diagnosed as pulmonary tuberculosis and tuberculous pleurisy with effusion.

Operative results in these cases are usually satisfactory. The reason for the occurrence of the pleural effusion is not certain. Possibly it is due to obstruction of the azygos vein. In any case this syndrome, ovarian fibroma with ascites and pleural effusion has been given the name Meig's syndrome.

In an attempt to increase student participation in the Medical Journal, an award of $50 will be made to the author of the best undergraduate article submitted for publication during the present year.

Articles should be typewritten, double spaced, and approximately 3000 words in length. All years are eligible for this award, and entries should be addressed to the Editor, Room 107, Anatomy Building.

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ABSTRACTS

MEDICINE

Histogenesis of Coronary Arteriosclerosis: Moon, H. D. and Rinehart, J. F., J.A.M.A., **6:** No. 4, October 1952, 481–488.

This study of the major coronary arteries of 250 individuals (most of whom died suddenly from traumatic or natural causes) describes the nature and sequence of the multiple pathological processes in the development of coronary arteriosclerosis.

The earliest lesion is characterized by the apparently simultaneous appearance in the intima of diffuse proliferation of subendothelial fibroblasts, increased amounts of mucoid ground substance, and focal fragmentation and degeneration of the internal elastic lamina. It is interesting to note that no correlation was found between these early arteriosclerotic lesions, and the occasional presence of fine lipid droplets. The fibroplastic proliferation was noted in all individuals past the age of 20.

Moderately advanced lesions consistently showed fibrous plaques, as well as a greater degree of diffiuse fibrous thickening. The depths and centres of the plaques contained moderate collagen, whereas the advancing intimal borders were fibroblastic. The internal elastic lamina shows more fragmentation and reduplication, and lipid is always present—as fine and coarse droplets deposited most heavily in the centres and bases of the plaques.

In the far advanced lesions, hyaline degeneration of the central and basal connective tissues of the plaques is seen, and calcification at the junction of intima and media and in the plaques appeared also.

The similarity between the arteriosclerotic lesions of monkeys in experimental pyridoxine deficiency, and the early lesions of arteriosclerosis found in man, is given as worthy cause for further investigation.

J. C. Stears

Adrenal Virilism—I. Diagnostic considerations and Treatment: Jailer, J. W., Louchart, J. and Cahill, G. F., J.A.M.A., **150:** No. 6, October 11, 1952, 575–579.

Fourteen patients with virilism due to bilateral adrenal hyperplasia were given either Cortisone or Compound F for various periods of time. In all patients there was a dramatic fall in the total neutral 17-ketosteroid values within four to five days, from the elevated levels characteristic of this disease to amounts approximately normal for the age and sex of the patients. Long-term administration of these steroids resulted in the appearance of some feminine traits in the genetic females. No manifestations of Cortisone toxity were noted.

In two patients with proved adrenal carcinoma, the administration of Cortisone was without effect on the excretion of 17-ketosteroids. It was postulated that the decrease in the ketosteroid excretion as a result of Cortisone administration in the former group is mediated through pituitary inhibition of ACTH, with resulting secondary adrenal atrophy. On the other hand, adrenal cortical neoplasms are independent of ACTH control, and therefore pituitary inhibition is without effect on the tumour. This difference in behaviour to Cortisone administration is used in the differential diagnosis of adrenal cortical hyperplasia and adrenal cortical neoplasms.

J. C. Stears

Mandibular Joint Neuralgia (Costen's Syndrome): Beyers, M. R. and Teich, S., Archives of Int. Med., **90:** No. 3, 389, 1952.

Mandibular joint neuralgia is a common syndrome that is often overlooked when a physician is presented with the problem of bizarre facial and head pain. The patient with this syndrome complains of vertex

and occipital pain, otalgia, glossodynia and pain about the nose and eyes. The pathology is either malocclusion from any cause or destructive changes of one or both mandibular joints.

Three cases are presented and discussed. In all these three the primary pathology was loss of posterior teeth with resulting malocclusion—the commonest etiological factor. Other causative factors include malocclusing natural teeth, ill-fitting dentures, impacted third molars and destructive lesions about the temporomandibular joint. There is no definite relationship between the onset of symptoms and the length of time these causal factors have existed.

Physical examination as well as revealing one of the causal factors may show tenderness to internal palpation, uneven movement or crepitus in the joint. X-rays will reveal the cause and occasionally local destructive changes in the joint itself.

Ear symptoms are nearly always present; there is a sense of "stuffiness" in the ear with impaired hearing, tinnitus, and dizziness all relieved in inflation of the Eustacian tube. Combinations of burning pain in the pharynx, pain along the nose or in the eyes with occipital or vertex pain may or may not be found. All symptoms are aggravated by eating, yawning and laughing; that is, any activity putting stress on the mandibular joint.

Anatomy offers a ready explanation for the varied symptoms. Essentially they are a result of irritation of the auriculotemporal and chorda tympani nerves which lie in close association with the joint.

Symptoms are immediately relieved when the malposition of the mandibular joints is corrected. In the cases discussed this was effected temporarily by replacing missing posterior teeth with a gauze pledget.

J. B. Redford

Prognosis of Angina Pectoris: Observations in 6,882 Cases: Block, W. J. et al., A.M.A.J., **150:** No. 4, 295, 1952.

Follow-up studies were made on all patients in whom a diagnosis of angina pectoris associated with coronary sclerosis had been made at Mayo clinic over a period of 18 years. Minimal follow-up was 5 years; maximal follow-up was 23 years.

Figures drawn from this study were as follows:

1. The average age at diagnosis of angina pectoris was 58.8 years.
2. The average duration of symptoms before diagnosis was 2.5 years.
3. The ratio of males to females was 4 to 1 with a higher ratio in younger age groups than in older.
4. Mortality was greatest in the first year (about 15%) and was approximately 9% per year thereafter. Prognosis for females was better than for males.
5. The five year survival rate was 58.4% (normal population is 86.9%), and the 10 year survival rate was 37.1% (normal population is 70.4%).

The prognosis was unfavourably influenced by factors such as hypertension, cardiac enlargement, myocardial infarction and congestive heart failure. Prognosis was best for those patients with angina pectoris and normal electrocardiograms, poorer in those with significant alteration in T. and Q waves, and poorest in those with conduction disorders.

Other factors associated commonly with angina pectoris were considered. It was found that prognosis was best if it was associated with obesity alone, poorer if associated with peptic ulcer or thyroid disease, and poorest if associated with diabetes or malignant disease. The more favorable prognosis in the obese groups can not be explained at this time.

J. B. Redford

SURGERY

Use of Radioactive Phosphorus in Mapping Brain Tumors at Operation: Morley, T. P. and Jefferson, Sir G., B.M.J., Sept. 13, 1952, pp. 575–8.

Brain tumors pick up chemical substances in much greater quantity than does the normal grey or white matter. This affinity for chemical substances seems to depend on the cellularity of the tumor rather than the immaturity or number of blood vessels in the tumor. The authors

have made use of these facts in their method of mapping the extent of a tumor after its site has been exposed or in pinpointing its location for biopsy.

They inject one millicurie of P32 intravenously the evening before operation—a period of approximately 12 hours. At operation the modified Gieger-Miller probe counter is used to detect the tumor by picking up the beta particles emanating from it when the probe is inserted into or very close to the tumor.

The uses of this method are:

1. Recognition of tumor tissue for biopsy —by exploring with the probe counter through a burr-hole to make sure that a cellular part of the tumor has been found.
2. Mapping the layout of a subcortical tumor—by sinking the counter at several points in the area.
3. Scanning the bed from which a tumor has been removed—not too reliable because probe is not sufficiently sensitive.
4. Negative information—rarely obtained, e.g. with a diffuse tumor or large hydrocephalus.

False negative recordings may be obtained if the probe does not enter the tumor tissue. False positive results can occur in scanning tumor beds because beta emissions travel farther in air than in the brain and thus may be picked up at nontumorous areas. Nonetheless this method is a valuable aid to the surgeon at operation in selected cases.

R. L. Ruderman

The Treatment of Narcotic Addiction: Vogel, V. H. Postgrad. Med. Vol. 12, No. 3, Sept. 1952.

Narcotic addiction is an immense problem, as broad as the whole national mental health program for it is the maladjusted individuals who are the addiction-prone persons who want to take drugs. The best protection from drug addiction is to have a normal psyche for rarely do emotionally normal persons become addicted; only 5% of 1000 consecutive cases at Lexington hospital were considered true accidental addicts.

At the hospital for treatment of narcotic addiction at Lexington, Kentucky, five steps are used in treatment:

1. The physical withdrawal which includes the handling of the abstinence syndrome.
2. A convalescent phase similar to that following an acute illness.
3. Psychiatric attention to diminish psychologic dependence on drugs.
4. Four to six months rehabilitation to remove physiologic traces of the drug.
5. Community follow-up to enable patients to make a new adjustment.

The author outlines four general principles that must be used.

1. Combined with a desire for treatment there must be an element of compulsion.
2. The addict must be in a closed type of institution unable to receive mail freely from outside.
3. The hospital must be a specialized type with no mingling of addicts with psychiatric cases who are apt to be "infected" by addicts.
4. Facilities must be available for follow-up.

Withdrawal should be begun immediately and extend from 3-14 days. As abrupt withdrawal of opiates may produce severe autonomic nervous disturbances e.g. sweating, hypernea, vomiting, methadone is substituted and gradually decreased during this period. Methadone produces a less severe although a more prolonged abstinence syndrome. The dosage is regulated by the severity of the abstinence symptoms from the addicting drug.

Barbiturate addiction is managed in the same manner but without the use of methadone. Physical dependence is rarer with barbiturates than with opiates—some patients taking two capsules a day indefinitely. Withdrawal symptoms may be delayed 10-12 hours. They are characterized by nervousness, apprehension and insomnia often followed by convulsions of the grand mal type and sometimes by a full-blown psychosis.

J. B. Redford

NEWS AND NOTES

Recent appointments and promotions in the Faculty include Dr. A. C. Singleton, Professor of Diagnostic Radiology and Head of the Department of Radiology and Dr. S. M. Campbell, Associate Professor and Head of the Department of Anaesthesia.

Promotions to the rank of Associate Professor in their respective departments include Dr. R. C. Dickson, Dr. H. E. Rykert, Dr. Gladys Boyd, Dr. A. G. Gornall and Dr. E. H. Botterell.

Dr. D. W. A. Duckworth and Dr. J. W. Lovett Doust have come from England to join the Departments of Anatomy and Psychiatry respectively.

* * *

The Donald C. Balfour lecture in Surgery was delivered on Monday, September 29th by Mr. Clifford Morson, O.B.E., F.R.C.S., Consulting Urologist, National Health Service, and Chairman of the Academic Board, Institute of Urology, University of London.

* * *

The annual meeting of the Association of Canadian Medical Colleges was held at the University of Toronto, Faculty of Medicine, on Wednesday, October 1st. The Dean of the Faculty, Dr. J. A. MacFarlane, is President of the Association.

* * *

At the centenary celebrations of Laval University, held on the weekend of September 19th, honorary degrees were conferred on the Dean, Dr. J. A. MacFarlane; the Professor of Surgery, Dr. R. M. Janes; and the Professor of Physiology, Dr. C. H. Best.

* * *

Twelve medical undergraduates have been recently honoured by election to the University of Toronto chapter of Alpha Omega Alpha Honour Medical Fraternity. They include E. D. Wigle, K. I. Dechert, J. W. Dawson, J. F. Mustard, J. B. Kopstein, S. L. Stancer and M. A. Simurda of Meds 5T3; R. J. Baird, J. C. Stears, E. Pike, C. A. Smythe and D. B. Montgomery of Meds 5T4.

* * *

Two new members of the Medical Society were elected recently. They are J. Wilkinson, the President of the Freshman year, Meds 5T8; and D. Cowan, the President of Meds 5T6.

* * *

The new Chairman of the Daffydil Committee for this year is E. Silverstein of Meds 5T4.

* * *

The Medical Glee Club resumed its activities on October 8th with a well attended meeting. This organization is open to all medical students who enjoy singing. Rehearsals are held every Wednesday at 5 p.m. in Room 111 of the Anatomy clude participation in Daffydil and a noonhour recital at Hart House. Students wishing to join are requested to come out as early in the season as possible.

* * *

Visitors to the Faculty during the months of October and November included Mr. John Bruce, C.B.E., F.R.C.S. of Edinburgh, Dr. E. C. Dodds of the Courtauld Institute of Biochemistry, Middlesex Hospital Medical School and Dr. J. H. Talbott, Professor of Medicine at the University of Buffalo, who addressed a stated meeting of the Academy of Medicine of Toronto on the subject "Gout and Gouty Arthritis".

* * *

Daffydil, the Annual Meds show will be held this year from December 15th to 19th in Hart House theatre. A new innovation will be the inclusion of an operetta which will constitute one half of the show. Original music has been written by Stan Bain, Stan Freeman, and Stan Greben, all of 5T3.

The annual Phi Delta Epsilon Fraternity Lecture was delivered by Lester A. Dragstedt, Ph.D., M.D., the Professor of Surgery at the University of Chicago, on Monday, November 17th at 5 p.m. in the north lecture room of the Medical Building. The subject of the lecture was "Physiology of Gastric Secretion and the Peptic Ulcer Problem."

* * *

The announcement has been made of recent undergraduate scholarship winners. Mr. H. H. Rottman was awarded the Samuel Godfrey Scholarship; Mr. H. Anderson has received the Medical Alumni Admission Scholarship valued at two hundred dollars; and Mr. F. H. Sweet has been awarded the Robert Bruce Bursary which has a value of one hundred dollars. All of these students are members of Meds 5T8.

* * *

M. W. U. A.

Dr. Helen Cunningham (nee Wassman) 4T7 attended a forum held by M.W.U.A. in the Common Room on October 9th. Her subject was "Opportunities for postgraduate work in the British Isles" and she spoke enthusiastically on the desirability of taking a wide training and the availability of positions in England. Many members were very interested in the positions offered, and all enjoyed the meeting very much.

* * *

A Halloween party was held at the home of Dr. Isobel Ayer, W.C.H. for all members of the M.W.U.A. A number of staff members of the W.C.H. were present and many discussions were held regarding different fields of work.

* * *

C.A.M.S.I.

The National Camsi convention was held in Quebec City from October 15 to October 18. D. Smith and T. Doran represented the University of Toronto at the meetings. The subjects discussed included the standardization of medical degrees throughout Canada, the assessment of hospitals in the interest of internes, the publication of national scholarships and bursaries available to Canadian medical students, a survey of interne remuneration and a survey of summer employment.

At the dinner given at each annual Camsi convention by the Charles E. Frosst Pharmaceutical Company, the Frosst Trophy, awarded each year to the best Canadian undergraduate medical journal, was presented. This year it was won by the University of Toronto Medical Journal, marking the second occasion in the three year history of the trophy that this Journal has been so honoured.

Also in conjunction with the convention was the Camsi Art Salon, which was shown publicly throughout the duration of the convention. The four divisions into which the Salon was divided were Fine Arts, Sketches, Monochrome Photography and Colour Photography. This year John Gibson of Meds 5T4 was awarded the first prize in the Fine Arts division, and Godfrey Lister of Meds 5T5 was awarded an honourable mention in the same division.

J. W. Goodwin

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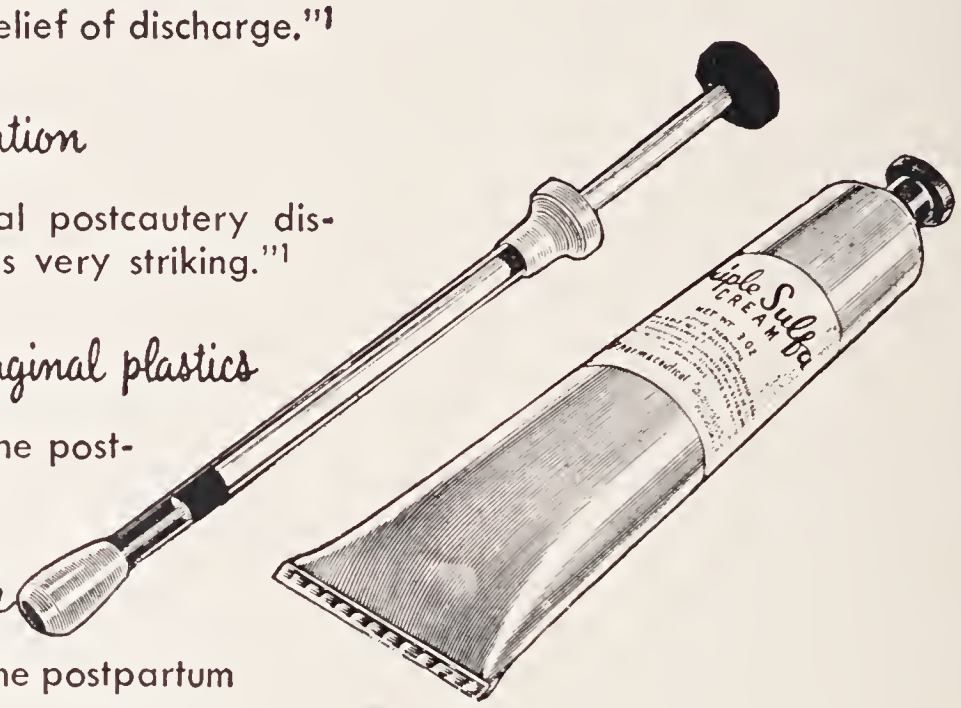

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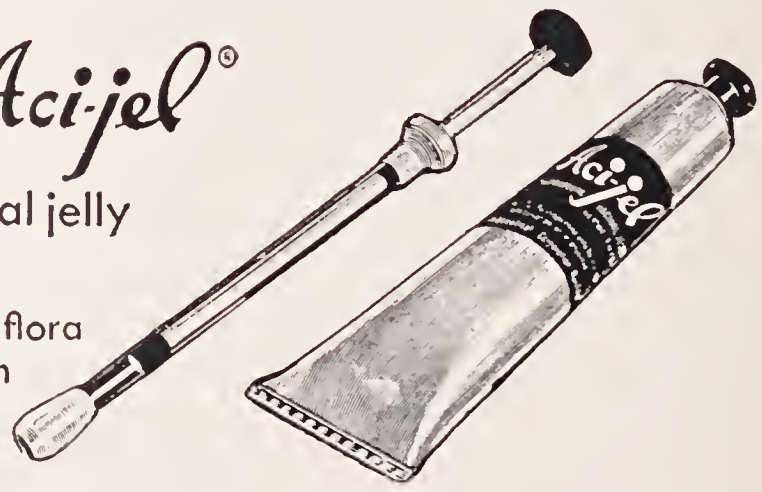

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1. Blinick, G.; Steinberg, P., and Merendino, J. V.: Am. J. Obst. & Gynec. 58:176, 1949.
2. Marbach, A. H.: Am. J. Obst. & Gynec. 55:511, 1948.
3. Palm, J. M.: Am. J. Obst. & Gynec. 61:680, 1951.
4. Weiner, A. E., and Nelson, H. B.: Am. J. Obst. & Gynec. 62:1106, 1951.

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Sulfadiazine	0.167 G.
Sulfamerazine	0.167 G.
(A total of 7½ gr. of sulfonamide.)	
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* Hunter, G. Wilson; Darner, C. B., and Gillam, J. S.: A method of Contraception Without Diaphragm — A Two- Year Investigation. Ann. New York Acad. Sc. **54**:825, 1952.

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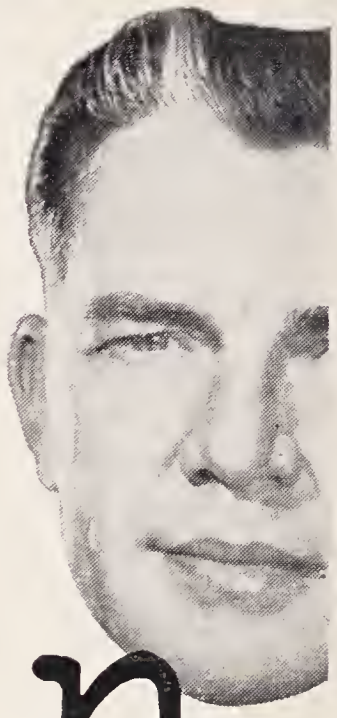

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